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DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Bureau of Sport Fisheries and Wildlife
Washington 25, D. C.

1958 STATUS REPORT OF WATERFOWL

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Special Scientific Report -- Wildlife No. 40

August 1958

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Note: This information has been hurriedly compiled both in the field and in Washington. Also, the report has not had the benefit of proof-reading or editing and should be regarded as subject to correction. The information contained in this report is for administrative use and is not for publication without permission of the contributing agency.

INTRODUCTION

Each year during early August the waterfowl shooting regulations for the fall season are established. At that time current information regarding the status of the population must be available to Game Administrators to provide a sound basis for the determinations.

Three surveys are conducted annually for the purpose of ascertaining waterfowl population status. These are: (1) a January survey of the continental wintering areas to measure the distribution and relative number of birds remaining after the close of the previous shooting season; (2) a survey among waterfowl hunters immediately following the shooting season to measure the size of the kill and the effect of hunting regulations on hunter activity and kill; and (3) a survey of the major continental breeding areas during May, June and July to measure size and distribution of the breeding population and the relative number of young produced.

This report summarizes the results of the three surveys and presents a forecast of anticipated change in the relative size of the 1958 fall flight of ducks, geese, brant, and coot in each of the waterfowl flyways in the United States.

SCOPE OF INVESTIGATIONS AND METHODS USED

Winter Survey

During recent years the survey of waterfowl wintering grounds has included the major wintering areas in Alaska, Canada, United States, and Mexico. In January 1957, due to circumstances beyond our control, it was not possible to carry out the survey in Mexico. Although the Mexican survey was conducted in January 1958, data are not available for making a comparison between 1957 and 1958 in this important wintering area.

In the United States, the Bureau of Sport Fisheries and Wildlife organized the surveys, but much of the field work was carried out by personnel of the 48 State Conservation Agencies. In Alaska the survey was carried out by Bureau personnel, while in Canada the Canadian Wildlife Service organized the survey and the field work was conducted by personnel of that Agency and the Provinces.

The wintering areas were surveyed by means of boats, cars and planes, with all important areas being covered from the air. Information as to personnel, equipment, and distances traveled, is presented in the following table:

Participation in 1958 Winter Waterfowl Survey

| Location | Number Observers | | | | Aerial Coverage | | | |
|-----------------------|------------------|-------|-------|-------|------------------|----------------|----------------|-----------------|
| | U. S. | State | Other | Total | Number Planes | Hours Flown | Miles Flown | Miles Driven |
| Pacific Flyway | 47 | 294 | 3 | 344 | 34 | 176 | 17,370 | ? |
| Central Flyway | ? | ? | ? | 435 | 36 | 259 | 22,915 | 44,750 |
| Mississippi Flyway | 85 | 795 | 12 | 892 | 49 | 253 | 23,756 | 51,231 |
| Atlantic Flyway | 40 | 122 | 23 | 185 | 31 | 274 | 18,998 | 6,477 |
| TOTAL U. S. | 172 | 1,211 | 38 | 1,856 | 150 | 962 | 83,039 | 102,458 |

Winter Survey - Continued

| Location | Number Observers | | | | Aerial Coverage | | | |
|-------------|------------------|--------|-------|--------|------------------|----------------|----------------|-----------------|
| | U. S. | State | Other | Total | Number Planes | Hours Flown | Miles Flown | Miles Driven |
| Alaska | 4 | - | - | 4 | 1 | 12 | 1,400 | - |
| Canada | ? | ? | ? | ? | ? | ? | ? | ? |
| Mexico | 4 | 1 | - | 5 | 2 | 106 | 13,780 | - |
| GRAND TOTAL | 180/ | 1,211/ | 38/ | 1,865/ | 153/ | 1,080/ | 98,219/ | 102,458/ |

Breeding Population and Production Surveys

The extensive breeding ground surveys initiated several years ago have been continued. These surveys now include two coverages of most of the important waterfowl breeding areas, the first coverage occurring in May for the purpose of measuring the distribution and relative size of the breeding population, and the second being made during July for the purpose of measuring the production of broods. A combination of data from important breeding areas forms the primary basis for forecasting changes in the relative size of the fall flight in each of the four flyways.

The bulk of the important waterfowl breeding areas in Alaska and Canada are surveyed from the air using statistically designed sampling techniques and similar methods of collecting and analyzing data. Survey methods vary somewhat among the 25 States conducting surveys, although the methods employed in the majority of States with important numbers of breeding ducks are similar in most respects to those employed in Canada and Alaska.

In 1958, aerial crews sampled approximately 2,375,000 square miles of the best duck breeding habitat on the continent. Ducks were counted on approximately 16,000 square miles of habitat, or somewhat less than one percent of the total breeding area. Although this may seem like a rather small portion of the total, sampling error was less than 20 percent of the average population density in most survey areas, and was considerably less than 20 percent when considering the breeding range as a whole.

The results of the breeding ground surveys are presented as "index" figures. When conducting aerial surveys of breeding birds, or of broods, not all birds present are seen and recorded. No attempt has been made to estimate the number which have been missed. The indices, therefore, are based on birds actually seen, and it is emphasized that they do not constitute an estimate of total population present. The "index" figures are not a measure of total populations, but they are representative of relative population levels to the extent that data from one location can be compared with those from another, and year-to-year changes can be detected. Although a measure of total population would have certain advantages, a determination of relative change is adequate for practical management.

The breeding ground surveys are cooperative in nature. The Bureau of Sport Fisheries and Wildlife, the Canadian Wildlife Service, the provincial game branches, and Ducks Unlimited, combine their manpower and equipment to cover all of the important waterfowl breeding areas in Canada. Bureau biologists cover the important areas in Alaska, while the State conservation agencies, with some help from the Bureau, carry on surveys in about 25 States.

Kill Survey

Each year following the shooting season the Bureau carries out a mail questionnaire survey among waterfowl hunters for the purpose of determining the number of birds killed and relationships between hunting regulations, hunter activity, and harvest. The specific objectives are as follows:

1. To estimate for each Flyway the kill of ducks, geese, and coots with a standard error of not to exceed 5 percent in the estimate of all ducks bagged.
2. To estimate total numbers of potential and active waterfowl hunters.
3. To estimate number of times the average hunter went afield during the season and the distribution of hunting activity through the season.
4. To estimate number of banded waterfowl that are bagged.
5. To estimate the geographic and density distribution of hunters in the areas of waterfowl hunting.

The survey functions through the cooperation of the Post Office Department and provides for a sampling of the hunters in each flyway in proportion to their occurrence in the various States. Mailing addresses for the questionnaire survey are obtained at the time duck stamps are purchased at a series of randomly selected post offices. The questionnaires are mailed out on the closing date of the shooting season in each State. Three weeks later, a follow-up questionnaire is sent to those who have not answered the first questionnaire. The number of questionnaires mailed out and the number returned in each Flyway are shown in the following table:

1957-58 Sample

| Flyway | No. of Hunters Receiving Questionnaires | | No. of Hunters Responding | | Percent Returned | |
|-------------|---|---------|------------------------------|---------|---------------------|---------|
| | 57 - 58 | 56 - 57 | 57 - 58 | 56 - 57 | 57 - 58 | 56 - 57 |
| Atlantic | 15,804 | 10,287 | 11,160 | 7,125 | 70.6 | 69.3 |
| Mississippi | 15,022 | 10,374 | 10,226 | 7,542 | 68.1 | 72.7 |
| Central | 8,087 | 6,809 | 5,386 | 4,685 | 66.6 | 68.8 |
| Pacific | 6,634 | 7,478 | 4,743 | 5,284 | 71.5 | 70.7 |
| TOTAL | 45,547 | 34,948 | 31,515 | 24,636 | 69.2 | 70.5 |

In addition to sampling errors, mail-questionnaire data contain response bias errors which result in an inflated estimate of kill. Experience has shown that these response errors are not consistent in size from one area to another nor from one year to the next in the same area. Also, they are large as compared to sampling error and their presence seriously limits the usefulness of survey data unless they are removed.^{1/}

Methods for removing response bias errors have been developed^{2/} and the kill data presented in this report have been adjusted in accordance therewith.

^{1/} E. L. Atwood, Validity of Mail Survey Data on Bagged Waterfowl, Journal of Wildlife Management, Vol. 20, No. 1, pp. 1-16.

^{2/} E. L. Atwood, A Procedure for Removing the Effect of Response Bias Errors from Waterfowl Questionnaire Responses, Biometrics, Vol. 14, No. 1, March 1958.

Pacific Flyway DataWaterfowl Kill Information

The following table presents the estimated number of waterfowl bagged and waterfowl knocked down but not retrieved during the 1956-57 and 1957-58 shooting seasons as determined by the Waterfowl Hunter Mail Survey:

| Species | 1957-1958 | 1956-1957 | Percent Change 1956-1957 to 1957-1958 |
|---------------------------|-----------|-----------|---|
| Mallard | 1,118,708 | 874,266 | / 27.96 |
| Pintail | 794,134 | 553,402 | / 43.50 |
| American Wigeon | 332,918 | 347,893 | - 4.30 |
| G-W Teal | 308,336 | 302,746 | N.C. |
| Shoveler | 140,575 | 157,501 | - 10.75 |
| Canvasback | 69,786 | 56,935 | / 22.57 |
| B-W Teal | 67,841* | 61,095* | / 11.04 |
| Ruddy | 49,997 | 66,651 | - 24.99 |
| Scaup | 40,316 | 36,377 | / 10.83 |
| Redhead | 30,641 | 23,589 | / 29.90 |
| Bufflehead | 18,264 | 16,777 | / 8.86 |
| Gadwall | 29,547 | 27,849 | / 6.10 |
| Goldeneye | 21,204 | 36,938 | - 42.60 |
| Cinnamon Teal | 41,264* | 35,415* | / 16.52 |
| Merganser | 12,390 | 16,643 | - 25.55 |
| Scoter | 5,613 | 3,395 | / 65.33 |
| Wood Duck | 9,135 | 10,834 | - 15.68 |
| Ringneck | 4,630 | 2,266 | / 104.32 |
| Others | 670 | 330 | / 103.03 |
| Total Ducks Retrieved | 3,095,968 | 2,630,902 | / 17.68 |
| Total Ducks not retrieved | 591,372 | 422,005 | / 40.13 |
| Total Duck kill | 3,687,340 | 3,052,907 | / 20.78 |
| Canada Goose | 100,507 | 91,442 | / 9.91 |
| Snow Goose | 82,422 | 67,455 | / 22.19 |
| Cackling Goose | 69,421 | 54,092 | / 28.34 |
| White-fronted Goose | 59,782 | 54,906 | / 8.88 |
| Brant Goose | 11,948 | 18,721 | - 36.18 |
| Others | 593 | - | - |
| Total Geese retrieved | 324,673 | 286,616 | / 13.28 |
| Total Geese not retrieved | 52,961 | 44,329 | / 19.47 |
| Total Goose kill | 377,634 | 333,945 | / 13.08 |
| Total retrieved Coot | 171,781 | 150,585 | / 14.08 |
| Total Coot not retrieved | 51,780 | 38,005 | / 36.25 |
| Total Coot kill | 223,561 | 188,590 | / 18.54 |

* It is probable that both Blue-winged and Cinnamon Teal are included in the estimates for each of these species since the coloration of the female in these species is identical. The net error resulting from this misclassification is unknown.

Pacific Flyway Data

Number of Hunters, Average Times Hunted, Seasonal Bag, Seasonal Unretrieved Kill and Daily Bag as Determined by the Waterfowl Hunter Mail Survey.

| | | 1957-1958 | 1956-1957 | Percent Change 1956-1957 to 1957-1958 | |
|--------------------------------------|-------|-----------|-----------|---|--------|
| <hr/> | | | | | |
| Number of Potential Hunters | | | | | |
| Over 15* | | 409,719 | 396,921 | / | 3.22 |
| Under 16 | | 28,638 | 42,192 | - | 32.12 |
| | | 438,357 | 439,113 | | N.C. |
| Number of Active Hunters** | | | | | |
| Over 15 | | 347,722 | 316,979 | / | 9.70 |
| Under 16 | | 22,527 | 31,231 | - | 27.87 |
| | | 370,249 | 348,210 | / | 6.33 |
| Average Times Hunted** | | 4.303 | 4.327 | | N.C. |
| Average Seasonal Bag** | | | | | |
| <u>Over 15</u> | Ducks | 8.691 | 7.925 | / | 9.67 |
| | Geese | .908 | .876 | | N.C. |
| | Coot | .451 | .414 | / | 8.94 |
| <u>Under 16</u> | Ducks | 3.276 | 3.804 | - | 13.88 |
| | Geese | .393 | .284 | / | 38.38 |
| | Coot | .666 | .620 | / | 7.42 |
| Average Seasonal No. not retrieved** | | | | | |
| <u>Over 15</u> | Ducks | 1.654 | 1.242 | / | 33.17 |
| | Geese | .148 | .134 | / | 10.45 |
| | Coot | .120 | .099 | / | 21.21 |
| <u>Under 16</u> | Ducks | .694 | .911 | - | 23.82 |
| | Geese | .059 | .059 | | N.C. |
| | Coot | .445 | .220 | / | 102.27 |
| Average Daily Bag** | | | | | |
| <u>Over 15</u> | Ducks | 2.020 | 1.832 | / | 10.26 |
| | Geese | .211 | .202 | / | 4.46 |
| | Coot | .105 | .096 | / | 9.38 |
| <u>Under 16</u> | Ducks | .761 | .879 | - | 13.42 |
| | Geese | .091 | .066 | / | 37.88 |
| | Coot | .156 | .143 | / | 9.09 |

* Individuals who purchased a Duck Stamp with intent to hunt.

** Individuals who hunted at least once.

Winter Trend Data - Pacific Flyway

As mentioned in the section under Scope of Investigations and Methods Used, it was not possible for the Bureau of Sport Fisheries and Wildlife to conduct the winter survey in Mexico in January 1957. Since there is some variation in the proportion of some species of Pacific Flyway waterfowl that winter in Mexico from year to year, there is some question as to the degree to which the data taken in Alaska, Canada, and the United States represents trends in the wintering population for the entire flyway. This is particularly true with the pintail, gadwall, baldpate, shoveler, green-winged teal, redhead and scaup. Mallards, most of the geese, swan, and the bulk of the coot winter in the United States and Canada, so it is likely that the data for these species is reasonably reliable as indicators of trends in wintering population.

Although it was not possible for Bureau representatives to make the regular waterfowl survey at the scheduled time, it was possible for waterfowl technicians from California to make a special survey trip in February 1957 to census the black brant areas in Baja California (Mexico). The data for black brant, therefore, are comparable to 1957.

The percent change in population between 1957 and 1958 is presented in the following two tables. The two graphs which follow present 10-year period 1949 through 1958 based on comparable coverage.

Percent Change in Pacific Flyway Population Index Figures for Ducks,
Geese, Brant, Swan, and Coot - January 1957 to January 1958
(Comparable Coverage)

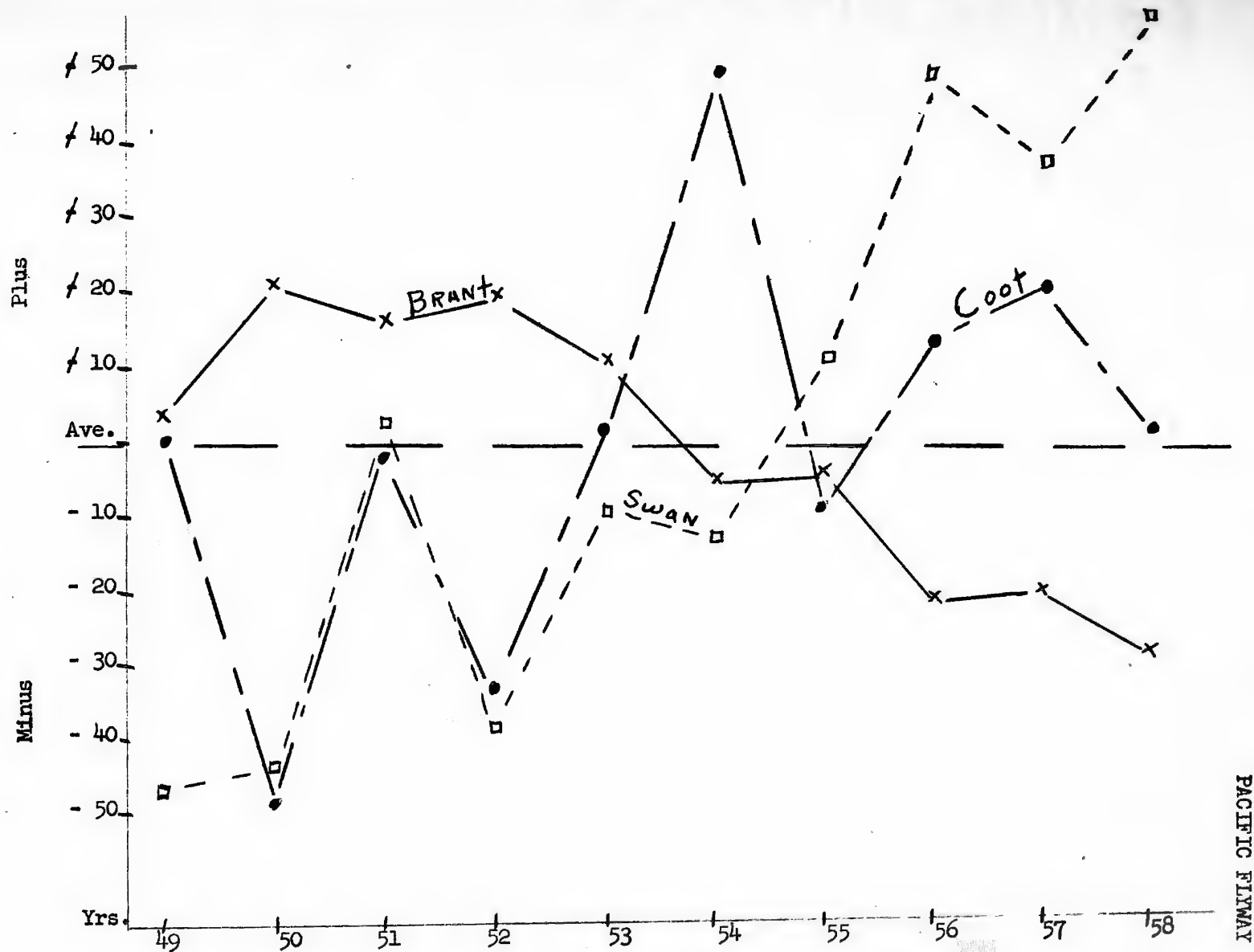
| Area | Ducks | Geese | Brant | Swan | Coot | Total |
|-----------------------------|-------|-------|-------|------|-------|-------|
| Alaska | ↑ 3 | ↑ 2 | | | | ↑ 3 |
| Canada* | ↑ 58 | - 18 | - 16 | ↑ 48 | ↑ 159 | ↑ 64 |
| Pacific Flyway States | ↑ 34 | ↑ 10 | - 6 | ↑ 16 | - 16 | ↑ 26 |
| Baja California (Mexico) | | | - 12 | | | |
| TOTAL | ↑ 34 | ↑ 10 | - 10 | ↑ 16 | - 16 | ↑ 26 |

* British Columbia

Species Composition - Pacific Flyway - 1957 and 1958
(Comparable Coverage)

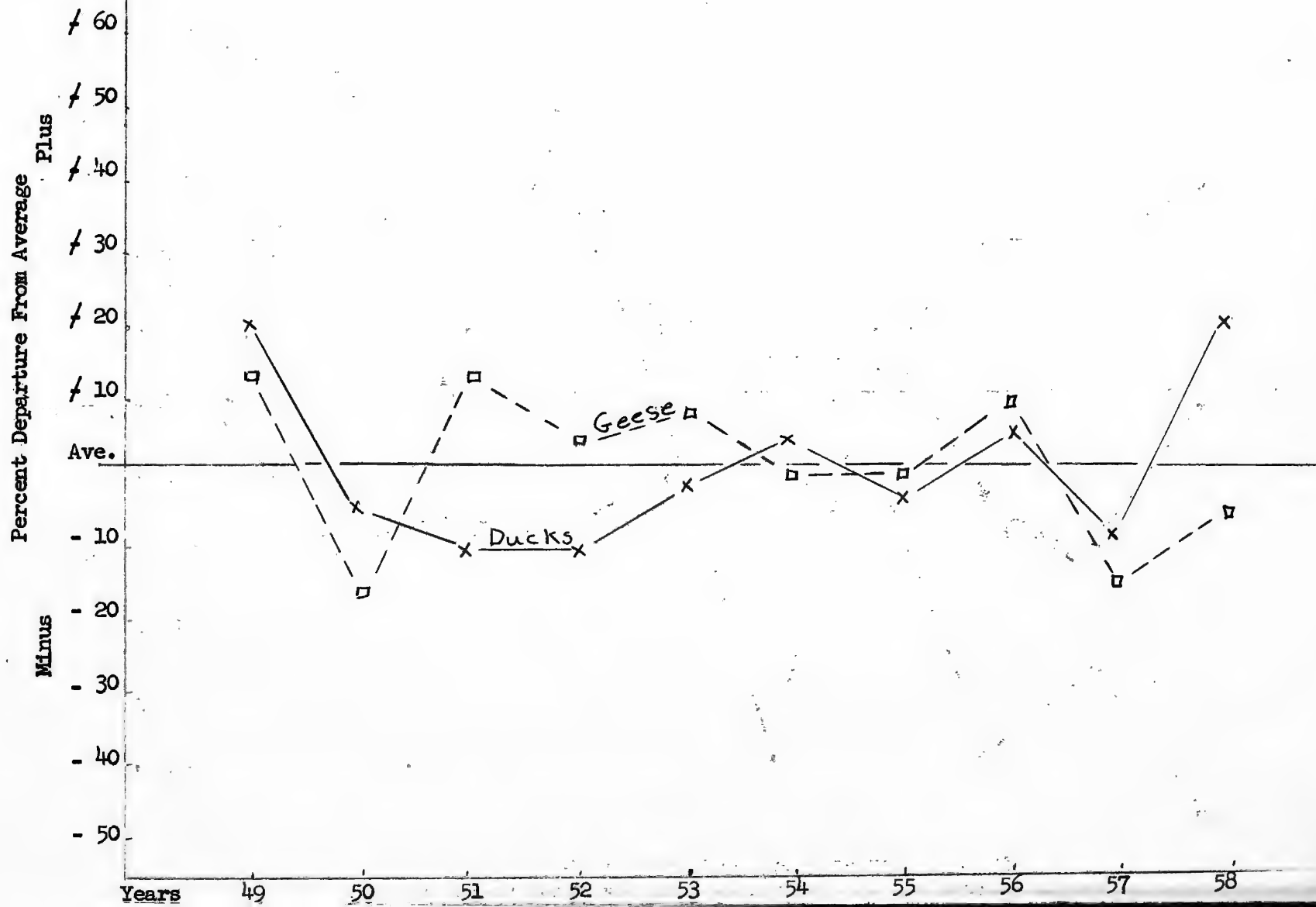
| Species | Percent of Birds Identified | | Percent Change |
|---------------------|-----------------------------|---------------|----------------|
| | 1957 | 1958 | |
| Pintail | 30.0 | 31.7 | / 33.7 |
| Mallard | 22.1 | 23.9 | / 37.1 |
| Coot | 11.6 | 7.8 | - 15.5 |
| Baldpate | 10.1 | 13.4 | / 68.3 |
| Snow Goose | 4.9 | 3.5 | - 9.7 |
| Green-winged Teal | 2.7 | 2.8 | / 32.7 |
| Scaup | 2.5 | 1.6 | - 22.2 |
| Canada Goose | 2.5 | 2.0 | - N.C. |
| Canvasback | 2.2 | 1.6 | - 7.8 |
| Shoveler | 2.0 | 2.7 | / 66.4 |
| Black Brant | 1.9 | 1.4 | - 9.8 |
| Cackling Goose | 1.6 | 2.1 | / 72.9 |
| White-fronted Goose | 1.3 | 1.3 | / 30.3 |
| Scoter & Elder | 1.2 | .9 | - N.C. |
| Ruddy | 1.1 | 1.1 | / 24.9 |
| Goldeneye | .6 | .4 | - 14.9 |
| Whistling Swan | .6 | .6 | / 16.9 |
| Merganser | .3 | .2 | / 6.5 |
| Bufflehead | .2 | .3 | / 113.9 |
| Gadwall | .2 | .4 | / 198.2 |
| Blue-winged Teal | .2 | Tr. | - 90.0 |
| Ross' Goose | .1 | .1 | - N.C. |
| Redhead | .1 | .1 | / 75.8 |
| Ringneck | Tr. | .1 | - |
| Emperor Goose | Tr. | - | - |
| Wood Duck | Tr. | Tr. | - |
| Trumpeter Swan | Tr. | Tr. | - 11.8 |
| Old Squaw | Tr. | Tr. | - |
| TOTAL | 100.00 | 100.00 | / 25.5 |

Trend in Brant, Swan, and Coot Populations in the Pacific Flyway
1949 Through 1958 (Comparable Coverage)



Trend in Duck and Goose Populations in the Pacific Flyway
1949 Through 1958 (Comparable Coverage)

21



ALASKAWeather and Water Conditions

Winter weather was exceptionally mild in Alaska with much less snow than normal. Following low precipitation of the year before, this left the surface water development in the lowest condition recorded for the past several years. Usually there is too much surface water in some areas for optimum nesting conditions. Under no foreseeable circumstances could lack of water be a limiting factor in the far north, however.

The spring breakup was earlier than usual in all of Alaska except on the Seward Peninsula, Kotzebue Sound and Arctic coast. In these north-westward areas the breakup did not occur until the first week in June. Consequently, many of the ducks were still concentrated near the river mouths and other small areas of open water. Following the breakup, the weather continued warm and dry creating excellent nesting conditions.

Breeding Population Indices

All the data summarized in the accompanying tables are comparable between 1957 and 1958. An accounting has been made for the change in observers. There was a sizeable increase in all the major species except bufflehead and canvasback. The latter species were down about 20 percent and 80 percent, respectively, but neither contribute appreciably to the total population under normal conditions. Overall the total breeding population was up 25 percent, game ducks and non-game species in equal proportions. Pintails and widgeons showed the greatest increase, 33 percent and 37 percent, respectively. (Table 2)

Table 3 summarizes the species composition. The non-game species comprise roughly one-third of the total breeding population as derived from aerial surveys.

Table 1--Statistical Summary, Alaska Waterfowl Breeding Population, 1958

| Stratum Number | Location | Area Sq. mi. | No. of 16-mi. x-sects | Sq.mi. Sampled | Mean Density Ducks per sq. mi. | | Population Index Total Ducks | | Population Index Game Ducks | |
|-------------------|----------------------|-----------------|-----------------------------|-------------------|-----------------------------------|------|---------------------------------|-----------|--------------------------------|-----------|
| | | | | | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 |
| II | Tanana- Kuskokwim | 8,900 | 14 | 56 | | | | | | |
| | Nelchina | 2,250 | 7 | 28 | | | | | | |
| | Innoko | 1,000 | 2 | 8 | | | | | | |
| | Kenai-Susitna | 3,000 | 12 | 48 | | | | | | |
| | Total | 15,150 | 35 | 140 | 8.9 | 5.5 | 107,800 | 83,530 | 90,380 | 70,165 |
| III | Nelchina | 1,750 | 8 | 32 | | | | | | |
| | Ft. Yukon | 3,000 | 2 | 8 | | | | | | |
| | Koyukuk | 4,650 | 10 | 40 | | | | | | |
| | Bristol Bay | 9,200 | 15 | 60 | | | | | | |
| | Innoko | 2,500 | 6 | 24 | | | | | | |
| | Yukon Delta | 17,500 | 35 | 140 | | | | | | |
| | Noatak | 550 | 2 | 8 | | | | | | |
| | Seward Pen. | 2,000 | 11 | 44 | | | | | | |
| III | Beetles | 1,200 | 3 | 12 | | | | | | |
| | Total | 42,350 | 92 | 368 | 14.5 | 17.7 | 589,700 | 751,280 | 360,250 | 521,560 |
| IV | Ft. Yukon | 2,800 | 14 | 56 | | | | | | |
| | Yukon Delta | 8,700 | 15 | 60 | | | | | | |
| | Kotzebue Sd. | 4,800 | 12 | 48 | | | | | | |
| | Norton Bay | 700 | 5 | 20 | | | | | | |
| | Total | 17,000 | 46 | 184 | 21.0 | 33.2 | 356,700 | 564,065 | 256,300 | 421,400 |
| V | Minto | 950 | 6 | 24 | | | | | | |
| | Northway | 700 | 7 | 28 | | | | | | |
| | Copper Delta | 300 | 5 | 20 | | | | | | |
| | Total | 1,950 | 18 | 72 | 32.4 | 40.2 | 53,600 | 78,400 | 51,400 | 77,400 |
| ALASKA Total | | 76,450 | 191 | 764 | 15.5 | 19.3 | 1,107,800 | 1,477,275 | 758,330 | 1,090,525 |

Table 2--Waterfowl Breeding Population Index, Comparative Data, 1957-1958

| Species | Stratum II | | Stratum III | | Stratum IV | | Stratum V | | Total | | Trend |
|------------|------------|--------|-------------|---------|------------|---------|-----------|--------|-----------|-----------|-------|
| | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | |
| Scaup | 54,450 | 37,340 | 201,000 | 258,750 | 161,300 | 265,700 | 25,400 | 25,700 | 442,150 | 587,490 | +25% |
| Pintail | 8,750 | 15,035 | 103,900 | 132,785 | 65,000 | 109,500 | 6,300 | 15,290 | 183,950 | 272,610 | +33% |
| Mallard | 5,500 | 4,425 | 22,400 | 22,000 | 9,300 | 17,500 | 8,700 | 19,050 | 45,900 | 62,975 | +27% |
| Baldpate | 4,300 | 1,750 | 18,250 | 31,110 | 5,400 | 15,800 | 5,100 | 4,000 | 33,050 | 52,660 | +37% |
| Bufflehead | 13,100 | 7,190 | 4,150 | 1,520 | 2,500 | 2,800 | 3,100 | 7,130 | 22,850 | 18,640 | -18% |
| Shoveller | - | - | 550 | 2,280 | - | 5,600 | - | 1,650 | 550 | 9,530 | - |
| Teal | 1,080 | 1,750 | 3,550 | 760 | 700 | 1,700 | 600 | 2,575 | 5,930 | 6,785 | - |
| Goldeneye | 3,200 | 2,675 | 550 | 835 | 2,800 | 1,700 | 1,400 | 1,000 | 7,950 | 6,210 | - |
| Canvasback | - | - | 5,900 | 1,520 | 9,300 | 1,100 | 800 | 775 | 16,000 | 3,395 | -80% |
| Gadwall | - | - | - | - | - | - | - | 230 | - | 230 | - |
| Scoter | 17,420 | 13,365 | 178,500 | 221,560 | 67,500 | 88,000 | 1,600 | 1,000 | 265,020 | 323,925 | +18% |
| Old Squaw | - | - | 50,650 | 78,160 | 25,000 | 29,900 | 600 | - | 76,250 | 108,060 | +30% |
| Eider | - | - | 300 | - | 7,900 | 24,200 | - | - | 8,200 | 24,200 | - |
| Merganser | - | - | - | - | - | 565 | - | - | - | 565 | - |
| TOTAL | 107,800 | 83,530 | 589,700 | 751,280 | 356,700 | 564,065 | 53,600 | 78,400 | 1,107,800 | 1,477,275 | +25% |

Table 3--Species Composition, Aerial Survey, 1958

| Stratum | Total Ducks | Scaup | Pintail | Mallard | Baldpate | Bufflehead | Shoveller | Teal | Goldeneye | Canvasback | Gadwall | Scoter | Old Squaw | Eider | Merganser |
|---------|-------------|-------|---------|---------|----------|------------|-----------|------|-----------|------------|---------|--------|-----------|-------|-----------|
| II | 83,530 | 44.7 | 18.1 | 5.5 | 2.1 | 8.9 | - | 2.1 | 3.3 | - | - | 15.2 | - | - | - |
| III | 751,280 | 34.4 | 17.7 | 2.9 | 4.1 | 0.2 | 0.3 | 0.1 | 0.1 | 0.2 | - | 29.5 | 10.4 | - | - |
| IV | 564,065 | 47.1 | 19.4 | 3.1 | 2.9 | 0.5 | 0.9 | 0.3 | 0.3 | 0.2 | - | 15.6 | 5.3 | 4.3 | - |
| V | 78,400 | 32.8 | 19.5 | 24.3 | 5.1 | 9.1 | 2.1 | 3.3 | 1.3 | 1.0 | tr. | 1.3 | - | - | - |
| TOTAL | 1,477,275 | 39.8 | 18.4 | 4.3 | 3.5 | 1.3 | 0.6 | 0.4 | 0.4 | 0.2 | tr. | 21.9 | 7.4 | 1.7 | tr. |

Production Surveys

As of July 24, 212 broods had been tallied in the Northway Study Area averaging 7.5 young per brood all age classes combined. This is a slightly larger brood size than was recorded last year and there appeared to be at least 25 percent more broods in the area than in 1957.

Conclusions

From all indications, the production has been considerably more favorable than last year, and with the 25 percent increase in the breeding population, at least 25-30 percent increase in production of all the major game species can be expected.

NORTHERN ALBERTA AND NORTHWEST TERRITORIES

Weather and Water Conditions

An unusually advanced and open spring prevailed throughout the survey area. Break-up was ten days to two weeks early on most of the smaller inland lakes, only the big, deep lakes showing ice during the period of the survey. Of the past eleven seasons this was by far the earliest phenologically.

Very little rain fell during the spring and the fire hazard was high. On the most southernly of the eleven strata surface water had disappeared from most of the temporary sloughs and low places, but north of 58° surface water was normal. In the northern area water levels may fluctuate up and down, but the area of surface water varies but little from year to year.

A contradiction to the general water pattern was the Athabaska delta-Lake Claire area, which suffered from too much water. This relatively small, high density area was flooded twice--once by the Athabaska river early in April and again by the Peace river early in May. When we crossed the delta again on June 16 most of it was still under water.

Breeding Population Indices

A study of tables 1 and 2 will reveal a general increase in most northern breeding ducks and also in some of the prairie ducks that normally occur in the north in only limited numbers. The outstanding advances numerically occurred in mallards and pintails--percentagewise shovelers, green-winged teals, goldeneyes, canvasbacks, blue-winged teals and ruddy ducks made some spectacular gains, although it should be noted that the latter three species occur in such limited numbers in the north as to be insignificant to the continental population. This applies to gadwall and red-heads as well.

| Area & Area | Year | Staup | Scoter | Pintail | Mallard | Baldpate | Shov. | C. W. Teal | C. Duck | Goldeneye |
|-----------------------------------|------|-----------|---------|---------|---------|----------|---------|------------|---------|-----------|
| 1. 1 Alta & 76,894 Sq. Mi. | 1958 | 278,200 | 69,900 | 199,250 | 367,900 | 77,500 | 45,600 | 33,400 | 50,200 | 194,600 |
| | 1957 | 140,300 | 25,400 | 100,200 | 213,500 | 90,200 | 15,400 | 7,700 | 10,800 | 30,800 |
| 1. 2 Alta & B. C. 117,010 Sq. Mi. | 1958 | 184,000 | 74,600 | 41,000 | 122,300 | 40,400 | 14,000 | 37,900 | 11,000 | 4,300 |
| | 1957 | 136,600 | 60,300 | 7,100 | 99,800 | 44,700 | 9,900 | 30,600 | -- | 3,300 |
| 2. Lake Claire 1,625 Sq. Mi. | 1958 | 10,100 | 200 | 17,500 | 37,800 | 5,800 | 3,300 | 1,200 | 11,900 | 11,900 |
| | 1957 | 10,100 | 1,200 | 25,400 | 32,700 | 10,700 | 6,100 | 2,700 | 4,700 | 7,400 |
| 3. N. W. T. 99,742 Sq. Mi. | 1958 | 223,800 | 83,900 | 11,600 | 150,800 | 29,300 | 2,000 | 17,700 | -- | 2,000 |
| | 1957 | 174,200 | 107,400 | 24,200 | 74,000 | 27,600 | -- | 5,800 | -- | 8,200 |
| 4. N. W. T. 77,146 Sq. Mi. | 1958 | 127,500 | 106,100 | 21,400 | 15,900 | 4,700 | -- | -- | -- | -- |
| | 1957 | 197,300 | 159,800 | 23,000 | 28,800 | 10,100 | -- | 1,400 | -- | -- |
| 5. Alta & NWT 12,100 Sq. Mi. | 1958 | 50,500 | -- | 88,000 | 123,100 | 40,700 | 81,500 | 53,400 | -- | 2,800 |
| | 1957 | 30,900 | 1,400 | 29,500 | 17,500 | 33,600 | 10,700 | 14,800 | -- | -- |
| 6 N. W. T. 4,050 Sq. Mi. | 1958 | 53,400 | 16,400 | 1,600 | 5,800 | 1,600 | -- | 2,500 | -- | -- |
| | 1957 | 93,600 | 12,000 | 4,800 | 10,800 | 6,600 | 600 | 2,100 | -- | -- |
| 7. N. W. T. 62,240 Sq. Mi. | 1958 | 307,800 | 289,800 | 33,800 | 8,600 | 15,700 | -- | 3,100 | -- | 16,500 |
| | 1957 | 272,400 | 395,100 | 40,900 | 14,700 | 24,500 | -- | 4,100 | -- | 2,500 |
| 8. N. W. T. 4,935 Sq. Mi. | 1958 | 35,800 | 27,200 | 84,500 | 13,900 | 6,500 | -- | 2,600 | 1,400 | 1,100 |
| | 1957 | 33,800 | 25,900 | 22,600 | 6,000 | 7,700 | -- | 1,100 | 1,100 | 3,000 |
| 9. N. W. T. 8,655 Sq. Mi. | 1958 | 38,500 | 52,600 | 9,600 | 600 | 2,600 | -- | 600 | -- | -- |
| | 1957 | 17,900 | 45,300 | 9,600 | 600 | 2,600 | -- | -- | -- | -- |
| 10. Yukon 1,970 Sq. Mi. | 1958 | 24,200 | 31,300 | 15,600 | 1,000 | 3,600 | 700 | 500 | 6,400 | 2,300 |
| | 1957 | 13,200 | 25,600 | 15,000 | -- | 3,200 | -- | 100 | 1,900 | 2,100 |
| TOTAL | 1958 | 1,333,800 | 752,000 | 523,800 | 847,700 | 228,400 | 147,200 | 152,900 | 80,900 | 235,500 |
| | 1957 | 1,120,300 | 859,400 | 302,300 | 498,400 | 261,500 | 42,700 | 70,400 | 18,500 | 57,300 |
| Percent Change from 1957 | | + 19 | - 12 | + 73 | + 70 | + 13 | +240 | + 117 | +337 | + 311 |

(1) Continued

| <u>STRATA & AREA</u> | <u>Year</u> | <u>Bufflehead</u> | <u>Old Sq.</u> | <u>Merg.</u> | <u>R-Neck</u> | <u>Red Hd.</u> | <u>B-W Teal</u> | <u>Ruddy</u> | <u>Gadwall</u> | <u>Total Ducks</u> |
|-----------------------------------|--------------|-------------------|--------------------|--------------------|------------------|------------------|------------------|-----------------|----------------|------------------------|
| 1.1 Alta & B.C. 76,894 Sq.Mi. | 1958 1957 | 56,200 29,300 | - 8,500 | 45,600 43,900 | 13,700 13,900 | 9,100 17,700 | 36,500 17,000 | 10,600 4,000 | 1,500 2,000 | 1,489,700 770,600 |
| 1.2 Alta & B.C. 117,010 Sq.Mi. | 1958 1957 | 47,700 44,700 | - 10,800 | 4,300 4,700 | 22,600 17,000 | - - | 6,100 - | 1,200 1,400 | - - | 611,500 470,900 |
| 2. Lake Claire 1,625 Sq.Mi. | 1958 1957 | 2,600 2,000 | - - | 1,900 3,000 | 700 800 | 4,800 7,300 | 2,500 2,400 | 900 800 | 200 600 | 113,300 117,900 |
| 3. N.W.T. 99,742 Sq.Mi. | 1958 1957 | 10,200 12,100 | 43,000 34,800 | 3,400 15,500 | - - | - - | - - | - - | - - | 577,700 483,800 |
| 4. N.W.T. 77,146 Sq.Mi. | 1958 1957 | - 1,400 | 48,600 32,600 | 57,900 25,400 | - - | - - | - - | - - | - - | 382,100 479,800 |
| 5. Alta & N.W.T. 12,100 Sq.Mi. | 1958 1957 | 9,400 - | - - | - - | 12,600 2,700 | - - | 6,100 - | - - | - - | 468,100 141,100 |
| 6. N.W.T. 4,050 Sq.Mi. | 1958 1957 | - 3,000 | 400 9,600 | 400 600 | - 6,000 | - - | - - | - - | - - | 82,100 149,700 |
| 7. N.W.T. 62,240 Sq.Mi. | 1958 1957 | - - | 94,200 53,200 | 15,700 10,600 | - - | - - | - - | - - | - - | 785,200 818,000 |
| 8. N.W.T. 4,935 Sq.Mi. | 1958 1957 | - - | - 4,600 | 2,500 1,300 | - - | - - | - - | - - | - - | 175,500 107,100 |
| 9. N.W.T. 8,655 Sq.Mi. | 1958 1957 | - - | 17,300 23,000 | 6,400 - | - - | - - | - - | - - | - - | 128,200 99,000 |
| 10. Yukon 1,970 Sq.Mi. | 1958 1957 | - - | 3,700 2,500 | 200 400 | - - | - - | - - | - - | - - | 89,500 64,000 |
| TOTAL | 1958 1957 | 126,100 92,500 | 207,300 179,600 | 138,300 105,400 | 49,600 40,400 | 13,900 25,000 | 51,200 19,400 | 12,700 6,200 | 1,700 2,600 | 4,902,900 3,701,900 |
| Percent Change from 1957 | | + 36 | + 15 | + 31 | + 23 | - 44 | + 160 | + 100 | - 33 | + 32 |

| <u>STRATA & AREA</u> | <u>Year</u> | <u>Canada Goose</u> | <u>W. F. Goose</u> | <u>Swan</u> |
|-----------------------------|-------------|---------------------|--------------------|-------------|
| 1.1 Alta & B.C. | 1958 | 5,400 | - | - |
| 76,894 Sq.Mi. | 1957 | 3,800 | - | - |
| 1.2 Alta & B.C. | 1958 | 17,600 | - | - |
| 117,010 Sq.Mi. | 1957 | 1,400 | - | - |
| 2. Lake Claire | 1958 | - | - | - |
| 1,625 Sq.Mi. | 1957 | 50 | - | - |
| 3. N.W.T. | 1958 | 16,600 | - | - |
| 99,742 Sq.Mi. | 1957 | 7,200 | - | - |
| 4. N.W.T. | 1958 | 11,400 | - | - |
| 77,146 Sq.Mi. | 1957 | 5,000 | - | 1,500 |
| 5. Alta & N.W.T. | 1958 | - | - | - |
| 12,100 Sq.Mi. | 1957 | - | - | - |
| 6. N.W.T. | 1958 | - | - | - |
| 4,050 Sq.Mi. | 1957 | - | - | - |
| 7. N.W.T. | 1958 | 1,300 | - | 8,100 |
| 62,240 Sq.Mi. | 1957 | 2,550 | - | 2,700 |
| 8. N.W.T. | 1958 | 100 | 800 | 300 |
| 4,935 Sq.Mi. | 1957 | 300 | - | 2,200 |
| 9. N.W.T. | 1958 | - | - | 4,500 |
| 8,655 Sq.Mi. | 1957 | 700 | 7,800 | 4,800 |
| 10. Yukon | 1958 | - | - | 400 |
| 1,970 Sq.Mi. | 1957 | - | - | 200 |
| TOTAL | 1958 | 52,400 | 800 | 13,300 |
| | 1957 | 21,000 | 7,800 | 11,400 |
| Percent Change from 1957 | | / 150 | - 89 | / 17 |

Progress of Nesting

This year the lone drake factor was 60%, 8% higher than in 1957 which, according to prairie standards would indicate early nesting. However, in 1957, an exceptionally late season, it was 10% higher than the year before.

Conclusions

Except for the Athabaska Delta there is nothing foreseeable that would tend to restrict production. Consequently we believe that changes in production and fall flight will be comparable to the percent changes in the breeding populations.

BRITISH COLUMBIA

On the basis of a wire from R. H. Mackay, the situation in British Columbia is as follows:

"Weather and water conditions in British Columbia most favorable to waterfowl production to date. Season a week advanced over normal. Midsummer waterfowl counts remain high and show little change in species or numbers from last year. Successful hatch indicates good fall flight."

SOUTHERN ALBERTAWeather and Water Conditions

The yearly drying trend is continuing with long-time averages decreasing in all strata. Water indices for 1957 were the lowest on record and those of 1958 rank just above those of 1957. May water of 1958 show improvement in the prairies and a small decrease in the parklands. July water of 1958 gave the same relationships reflecting somewhat increased water in the prairie and small decrease for the parklands over 1957 figures. For the province as a whole, May water was down 21% from the long time average and 14% above the 1957 low. For July provincial figures were 29% below the long-time average and 5% above the 1957 low. The number of water areas in July had declined from the May count by 47% in Stratum A, 34% in Stratum B and 56% in Stratum C, and 41% for the province. Comparable figures for 1957 were declines of 36%, 34%, 48% and 37%. A decline of water is normal except in local areas where excessive seasonal rainfall occurs. With losses of this magnitude water was sufficient to accommodate the larger brood indices. Refer to Table I for a summary of this water data.

The number of water areas does not appear to be a critical factor. The waterfowl seasons of 1957 and 1958, the two fines for which we have records, yielded our lowest water indices. There is evidence that the rate at which the available water disappears may be more critical for nesting waterfowl than mere numbers of water areas.

Table I. Water Areas on Aerial Transects - Alberta

| | Stratum A | | | | | | Stratum B | | | | | |
|-------------|-----------|--------|--------|---------|--------|--------|-----------|--------|--------|---------|--------|--------|
| | May | | | July | | | May | | | July | | |
| | Average | 1957 | 1958 | Average | 1957 | 1958 | Average | 1957 | 1958 | Average | 1957 | 1958 |
| Total Ponds | | | | | | | | | | | | |
| Seen | | 2225 | 3036 | | 1429 | 1622 | | 3203 | 3118 | | 2082 | 2043 |
| Ponds Per | | | | | | | | | | | | |
| Square Mile | | 815 | 11.56 | | 5.43 | 6.16 | | 16.9 | 16.50 | | 11.01 | 10.81 |
| Index | 343404 | 186647 | 254720 | 230837 | 119893 | 136086 | 548400 | 442334 | 430596 | 355269 | 287524 | 282138 |
| Percent | | | ↑ 36* | | | ↑ 13 | | | - 3 | | | - 2 |
| Change | | | - 26** | | | - 41 | | | - 21 | | | - 21 |

| | Stratum C | | | | | | Province | | | | | |
|-------------|-----------|-------|--------|---------|-------|-------|----------|--------|--------|---------|--------|--------|
| | May | | | July | | | May | | | July | | |
| | Average | 1957 | 1958 | Average | 1957 | 1958 | Average | 1957 | 1958 | Average | 1957 | 1958 |
| Total Ponds | | | | | | | | | | | | |
| Seen | | 433 | 638 | | 224 | 281 | | 5861 | 6792 | | 3735 | 3946 |
| Ponds Per | | | | | | | | | | | | |
| Square Mile | | 5.06 | 7.46 | | 2.62 | 3.29 | | 11.1 | 12.63 | | 6.94 | 7.34 |
| Index | 130027 | 81595 | 120225 | 79340 | 42411 | 52952 | 1021173 | 705992 | 805541 | 665484 | 449828 | 471176 |
| Percent | | | ↑ 47* | | | ↑ 25 | | | ↑ 14 | | | ↑ 5 |
| Change | | | - 7** | | | - 33 | | | - 21 | | | - 29 |

* Percent change from previous year.

** Percent change from average.

SOUTHERN ALBERTA - Continued

Breeding Population Indices

Early season impressions have been confirmed and our provincial breeding pair index is at its highest level being 18% above the seven-year average and 14% above the 1957 index. This represents a significant increase with Strata B and C showing the greatest change. Nearly all species indices have raised. Only the pintail, green-winged teal and minor diving species have indices lower than average conditions (See Tables 2 through 5). All indices except for scaup and goldeneye are in excess of 1957 figures.

Table 2. Comparison of Aerial Waterfowl Population Indices - 1957-1958

| | <u>Strata A</u> | | <u>Strata B</u> | | <u>Strata C</u> | | <u>Province</u> | |
|--------------|-----------------|---------|-----------------|---------|-----------------|--------|-----------------|---------|
| | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 |
| Total Area | | | | | | | | |
| Square Miles | 22088 | 22088 | 26100 | 26100 | 16112 | 16112 | 64300 | 64300 |
| Sample Area | | | | | | | | |
| Square Miles | 526.5 | 526.5 | 378.0 | 378.0 | 171.0 | 171.0 | 1075.5 | 1075.5 |
| Total Ducks | | | | | | | | |
| in Sample | 24416 | 26328 | 20032 | 22370 | 2638 | 4442 | 47086 | 53140 |
| Total Ducks | | | | | | | | |
| Square Mile | 46.37 | 50.00 | 53.00 | 59.18 | 15.43 | 25.98 | 41.31 | 47.71 |
| Index in | | | | | | | | |
| Total Ducks | 1024251 | 1104459 | 1383210 | 1544649 | 248553 | 418525 | 2656014 | 3067633 |
| Percent | | | | | | | | |
| Change | | ↑ 8 | | ↑ 12 | | ↑ 68 | | ↑ 15 |

Table 3. Comparison of Aerial Waterfowl Population Indices - 1958

| | <u>Strata A</u> | | <u>Strata B</u> | | <u>Strata C</u> | | <u>Province</u> | |
|-------------|-----------------|---------|-----------------|---------|-----------------|--------|-----------------|---------|
| | 7 Year | 1958 | 7 Year | 1958 | 7 Year | 1958 | 7 Year | 1958 |
| Index in | | | | | | | | |
| Total Ducks | 1088505 | 1104459 | 1125395 | 1544649 | 375549 | 418525 | 2589436 | 3067633 |
| Percent | | | | | | | | |
| Change | | ↑ 1 | | ↑ 37 | | ↑ 11 | | ↑ 18 |

Table 4. 1958 Breeding Population Indices Compared to 1957

| | Stratum A | | Stratum B | | Stratum C | | Province | | Percent Change |
|------------|-----------|--------|-----------|--------|-----------|--------|----------|---------|----------------|
| | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | |
| Pintail | 337782 | 332580 | 157710 | 169444 | 99685 | 153579 | 595177 | 651603 | + 9 |
| Mallard | 329811 | 383255 | 616341 | 652108 | 91770 | 150666 | 1037922 | 1194029 | + 15 |
| Baldpate | 58346 | 68798 | 87297 | 91008 | 10741 | 19221 | 156666 | 179027 | + 14 |
| Shoveler | 82306 | 97240 | 63526 | 94184 | 8857 | 25251 | 154689 | 216675 | + 40 |
| Gadwall | 22317 | 29952 | 35630 | 43363 | 2827 | 5842 | 60774 | 79157 | + 30 |
| B-W Teal | 49165 | 54283 | 83274 | 114623 | 1508 | 4899 | 133947 | 173865 | + 30 |
| Cinn. Teal | - | 336 | | | | | - | 336 | - |
| G-W Teal | 8977 | 8977 | 21958 | 24444 | 188 | 942 | 31123 | 34363 | + 10 |
| Scaup | 106805 | 97240 | 193202 | 174696 | 26758 | 36746 | 326765 | 308682 | - 6 |
| Canvasback | 8474 | 8558 | 44054 | 78303 | 1508 | 7160 | 54036 | 94021 | + 74 |
| Redhead | 14347 | 16360 | 27344 | 42811 | 3392 | 3769 | 45083 | 62940 | + 40 |
| Ruddy | 1258 | 3104 | 11048 | 11739 | - | 754 | 12306 | 15597 | + 27 |
| Bufflehead | 1846 | 1846 | 15329 | 18644 | - | 942 | 17175 | 21432 | + 25 |
| Goldeneye | 755 | 419 | 2624 | 1933 | 1319 | 754 | 4698 | 3106 | - 34 |
| Ringneck | - | 336 | - | 276 | - | - | - | 612 | |
| Scoter | 1762 | 1175 | 23891 | 31073 | - | - | 25653 | 32248 | + 26 |
| Coots | 7214 | 21017 | 33489 | 46263 | 3015 | 6972 | 43718 | 74252 | + |

Table 5. 1958 Breeding Population Indices Compared to Seven-Year Average

| | <u>Stratum A</u> | | <u>Stratum B</u> | | <u>Stratum C</u> | | <u>Province</u> | | Percent Change |
|------------|---------------------------|-------------|---------------------------|-------------|---------------------------|-------------|---------------------------|-------------|-------------------|
| | <u>7 Year Average</u> | <u>1958</u> | <u>7 Year Average</u> | <u>1958</u> | <u>7 Year Average</u> | <u>1958</u> | <u>7 Year Average</u> | <u>1958</u> | |
| Pintail | 405565 | 332580 | 157957 | 165444 | 158959 | 153579 | 722480 | 651063 | - 10 |
| Mallard | 314140 | 383255 | 486417 | 652108 | 122041 | 158666 | 922569 | 1194029 | / 29 |
| Baldpate | 69922 | 68798 | 71536 | 91008 | 22160 | 19221 | 163563 | 179027 | / 9 |
| Shoveler | 87937 | 97240 | 58436 | 94184 | 17910 | 25251 | 164282 | 216675 | / 32 |
| Gadwall | 24554 | 29952 | 31859 | 43363 | 4723 | 5842 | 61145 | 79157 | / 29 |
| B-W Teal | 53532 | 54283 | 80597 | 114623 | 4887 | 4899 | 139013 | 173805 | / 25 |
| Cinn. Teal | 100 | 336 | - | - | 309 | - | 406 | 336 | - 17 |
| G-W Teal | 12011 | 8977 | 22086 | 24444 | 2701 | 942 | 36780 | 34363 | - 7 |
| Scaup | 92730 | 97240 | 115106 | 174696 | 27980 | 36746 | 230672 | 308682 | / 34 |
| Canvasback | 10124 | 85558 | 42500 | 78303 | 4299 | 2160 | 55923 | 94021 | / 68 |
| Redhead | 15835 | 16360 | 29219 | 42811 | 7807 | 3769 | 52860 | 62940 | / 19 |
| Ruddy | 4542 | 3104 | 10099 | 11739 | 1081 | 754 | 15722 | 15597 | - 1 |
| Bufflehead | 1856 | 1846 | 12608 | 18644 | 578 | 942 | 15043 | 21432 | / 42 |
| Goldeneye | 671 | 419 | 2112 | 1933 | 973 | 754 | 3923 | 3106 | - 21 |
| Ringneck | 224 | 336 | 533 | 276 | - | - | 776 | 612 | - 21 |
| Scoter | 1594 | 1175 | 31165 | 31073 | 188 | - | 32947 | 32248 | - 2 |
| Coots | 33570 | 21017 | 46935 | 46263 | 12710 | 6972 | 93215 | 74252 | - 20 |

SOUTHERN ALBERTA - Continued

A measure of the progress of the breeding season is estimated by the lone males present in the population. This is best characterized by the early breeders, mallards, pintails and canvasback. The data are presented in Table 6.

Table 6. Percent Lone Males in Early Nesting Species
(Pintail, Mallard and Canvasback)

| <u>Year</u> | <u>Stratum A</u> | <u>Stratum B</u> | <u>Stratum C</u> | <u>Province</u> |
|---------------|------------------|------------------|------------------|-----------------|
| 1956 | 86% | 87% | 71% | 84% |
| 1957 | 90% | 92% | 89% | 90% |
| 1958 | 85% | 87% | 76% | 85% |
| 6-Yr. Average | 80% | 85% | 72% | 81% |

SOUTHERN ALBERTA - Continued

Production Indices

Table 7 represents a summation of our aerial production data for 1958. Another banner year is indicated for Alberta. The indices for breeding birds exceeded all other years and our index for broods has done likewise. While the success of the hatch was reduced somewhat by early season drought in the prairies the phenomenal success of the hatch in the parklands more than offset this loss and gave an increase for the province as a whole.

Table 7. Aerial Production Data - 1957 - 1958

| | <u>Strata A</u> | | <u>Strata B</u> | | <u>Strata C</u> | | <u>Province</u> | |
|--------------|-----------------|--------|-----------------|---------|-----------------|-------|-----------------|---------|
| | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 |
| Area | | | | | | | | |
| Square Miles | 22088 | 22088 | 26100 | 26100 | 16112 | 16112 | 64300 | 64300 |
| Sample | | | | | | | | |
| Square Miles | 263.25 | 263.25 | 189.0 | 189.0 | 85.5 | 85.5 | 537.75 | 537.75 |
| Total Broods | | | | | | | | |
| Seen | 1353 | 1218 | 1471 | 1925 | 111 | 48 | 2935 | 3191 |
| Broods Per | | | | | | | | |
| Square Mile | 5.14 | 4.63 | 7.78 | 10.18 | 1.29 | 0.56 | 5.46 | 5.93 |
| Est. No. | | | | | | | | |
| Broods | 113532 | 102267 | 203058 | 265698 | 20784 | 9023 | 337379 | 376988 |
| Pot. Later | | | | | | | | |
| Broods | 126 | 154 | 66 | 46 | 24 | 47 | 216 | 247 |
| Pot. Broods | | | | | | | | |
| Per Sq. Mi. | 0.48 | 0.58 | 0.35 | 0.24 | 0.28 | 0.55 | 0.40 | 0.46 |
| No. Pot. | | | | | | | | |
| Later Broods | 10602 | 12811 | 9135 | 6264 | 4511 | 8862 | 24248 | 27937 |
| Brood Index | 124134 | 115078 | 212193 | 271962 | 25291 | 17885 | 361622 | 404925 |
| Ind. Broods | | | | | | | | |
| Per Sq. Mi. | 5.62 | 5.21 | 8.13 | 10.42 | 1.55 | 1.11 | 5.62 | 6.30 |
| Average | | | | | | | | |
| Brood Size | 6.21 | 6.02 | 6.34 | 6.48 | 5.70 | 5.31 | 6.25 | 6.30 |
| Est. No. | | | | | | | | |
| Young | 770872 | 693920 | 1345304 | 1762314 | 144159 | 94969 | 2260335 | 2551203 |
| Percent | | | | | | | | |
| Change | | - 10 | | / 31 | | - 34 | | / 13 |

SOUTHERN ALBERTA - Continued

The brood index for the province is the highest recorded. Brood sizes average 6.04 somewhat higher than the average of 5.8 and lower than 6.25 of last year.

Evidence of potential later broods is low but not as low as 1957. It is higher in Strata A and C and lower in the parklands compared to 1957. This is evidence of a very successful hatch in the parklands and a minor disturbance to nesting waterfowl in the prairie--undoubtedly the drought conditions during May.

Although cost breeding populations are still below average, phenomenal increases were recorded in all strata this year over 1957. Provincial figures increased 70% in 1958 compared with 1957

Coot brood indices have been recorded for three years. The 1957 coot brood index was 74,700. This was an increase over 1956. In 1958 our index increased again and was 107,000. This index has almost doubled since 1956.

Conclusions

The aerial observation indices of breeding and production surveys for 1958 have recorded our highest indices. Breeding populations showed a gain of 15% over 1957 and 18% over our seven-year average. Our production is in excess of last year. We forecast a significant increase in the fall flight from Alberta approximating 15% over the 1957 fall flight.

WASHINGTONWeather and Water Conditions

The spring and summer was dry and warm in eastern Washington and caused a decrease of 32 percent in the number of potholes in this portion of the State.

Breeding Population and Production Indices

A decrease in duck production occurred in western Washington, the northeastern highland and the far eastern potholes. The irrigated portions of the State have shown a moderate increase in production, which was not sufficient, however, to offset the decline elsewhere.

The mallard has apparently been responsible for most of the decrease. This species is down 53 percent in far eastern Washington and 30 percent in western Washington. Diving ducks and the other species of dabblers have generally shown increases throughout the State. Coots are expected to be up about ten percent.

The waterfowl production index for the State is expected to be about 538,000 (see table). This includes young and adults at the end of the production season.

Comparison of Waterfowl Production of Previous Years
With That Anticipated for 1958

| Region | 1953 | 1954 | 1955 | 1956 | 1957 | Est. 1958 |
|--------------------|---------|---------|---------|---------|---------|--------------|
| Eastern Washington | 364,500 | 377,500 | 366,500 | 468,500 | 492,200 | 458,000 |
| Western Washington | 38,000 | 35,000 | 25,300 | 64,900 | 87,600 | 80,000 |
| TOTAL | 402,500 | 412,500 | 391,800 | 533,400 | 579,800 | 538,000 |

Conclusions

Based mainly upon the first census of waterfowl transects, production in Washington is expected to be down about 7 percent from last year on ducks, with little or no increase in Canada geese.

IDAHO

Weather and Water Conditions

The spring run-off was quite gradual and flooding was not a serious problem in any area of the State. Most reservoirs filled and still contain adequate water for brood purposes. There were no weather disturbances of a large enough scale to seriously affect waterfowl production in the State.

Breeding Population Indices

An aerial count was taken in the major goose nesting areas of the State for the fourth consecutive year. The results as given in Table 1 indicate an 18% increase in total geese from last year and a 34% increase from the average of the three previous years. The major area of increase was eastern Idaho where the Gray's Lake-Blackfoot Reservoir-Dingle Marsh complex increased 26% from last year and 55% from the average of the three previous years. Since a significant portion of this increase was in the "pairs" category, the aerial count figures are encouraging.

Production Indices

Goose Nesting. Canada goose nesting studies were continued in several areas of the State. The results, as shown in Table 2, do not indicate total estimated production. They show population trends based on the number of and hatching success of nests found on the same areas covered in the same manner each year. On this basis, the estimated production on four areas with trend information for seven years is 11% below last year and 2% below the average for the previous six years. The estimated production on six areas with trend data for five years is 8% below last year and 2% below the average for the previous four years. The reduction was due entirely to a 29% drop from the previous year on estimated production on the Homedale unit. For all practical purposes these birds are non-migratory. The eastern Idaho units all showed an increase. Collectively, it amounted to 19% over last year.

Ducks. Duck brood production routes were counted in three areas of the State. The routes were run twice with all classes of broods counted on the first run and only Class I broods counted on the second run. The results are shown in Tables 3 and 4. The south-central Idaho counts were up 47% from last year. The Camas National Wildlife Refuge counts were down 59% from 1956 (no count in 1957) and 14% from the previous four-year average. The Blackfoot Reservoir count was up 58% above 1956 (no count in 1957) and 67% above the previous four-year average.

Brood counts on over 300 broods of all classes indicate average survival to Class III size.

TABLE 1

Idaho Canada Goose Aerial Count - 1955-1958

| Area | 1955 | 1956 | 1957 | 1958 | 1955 | 1956 | 1957 | 1958 | 1955 | 1956 | 1957 | 1958 |
|--------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|--------------|
| <u>Snake River Drainage</u> | | | | | | | | | | | | |
| Farewell Bend to Railroad Bridge | 460 | 352 | 459 | 474 | 248 | 77 | 278 | 236 | 1168 | 781 | 1196 | 1184 |
| Payette River (mouth to Emmett) | 110 | 109 | 120 | 88 | 41 | 21 | 101 | 169 | 261 | 239 | 341 | 345 |
| Strike Dam to American Falls Dam | 95 | 56 | 48 | 92 | 77 | 97 | 34 | 61 | 267 | 209 | 130 | 245 |
| North Fork, including Island Park | 24 | 37 | 66 | 106 | 173 | 143 | 148 | 136 | 221 | 217 | 280 | 348 |
| South Fork | 48 | 46 | 36 | 59 | 36 | 9 | 44 | 25 | 132 | 101 | 116 | 143 |
| Mud Lake-Camas NWR Area | 96 | 108 | 82 | 108 | 28 | 19 | 49 | 69 | 220 | 235 | 213 | 285 |
| Gray's Lake Area | 124 | 106 | 145 | 176 | 43 | 70 | 156 | 74 | 291 | 282 | 446 | 426 |
| Blackfoot Reservoir Area | 54 | 83 | 113 | 217 | 198 | 280 | 185 | 73 | 306 | 446 | 411 | 507 |
| <u>Bear River Drainage</u> | | | | | | | | | | | | |
| Dingle Marsh Area | <u>171</u> | <u>140</u> | <u>269</u> | <u>447</u> | <u>132</u> | <u>197</u> | <u>176</u> | <u>160</u> | <u>474</u> | <u>477</u> | <u>714</u> | <u>1,054</u> |
| <u>Totals</u> | 1,182 | 1,037 | 1,338 | 1,767 | 976 | 913 | 1,171 | 1,003 | 3,340 | 2,987 | 3,847 | 4,537 |

TABLE 2

Comparison of Goose Production on Idaho Study Areas - 1952-1958

| | Glenns Ferry | Homedale | Blackfoot Reservoir | Island Park Reservoir | North Fork Snake River | North Lake | Total* |
|-------------------|-----------------|----------|------------------------|--------------------------|---------------------------|------------|------------|
| <hr/> | | | | | | | |
| No. nests found | | | | | | | |
| 1952 | 24 | 208 | 103 | 16 | - | - | 351 |
| 1953 | 24 | 250 | 121 | 44 | - | - | 439 |
| 1954 | 34 | 216 | 132 | 42 | 39 | 24 | 424 (487)* |
| 1955 | 16 | 189 | 117 | 34 | 32 | 31 | 356 (419)* |
| 1956 | 15 | 214 | 86 | 38 | 32 | 40 | 353 (425)* |
| 1957 | 13 | 253 | 99 | 32 | 35 | 32 | 397 (464)* |
| 1958 | 8 | 208 | 89 | 51 | 40 | 31 | 356 (427)* |
| No. nests hatched | | | | | | | |
| 1952 | 16 | 103 | 75 | 12 | - | - | 206 |
| 1953 | 11 | 180 | 74 | 36 | - | - | 301 |
| 1954 | 9 | 169 | 78 | 36 | 34 | 19 | 292 (345)* |
| 1955 | 1 | 125 | 81 | 19 | 21 | 26 | 226 (273)* |
| 1956 | 6 | 123 | 61 | 34 | 31 | 34 | 224 (289)* |
| 1957 | 8 | 194 | 50 | 23 | 25 | 25 | 275 (325)* |
| 1958 | 7 | 151 | 59 | 28 | 35 | 28 | 245 (308)* |
| Average hatch | | | | | | | |
| 1952 | 5.1 | 4.7 | 4.7 | 4.0 | - | - | 4.7 |
| 1953 | 5.4 | 5.0 | 4.8 | 4.6 | - | - | 4.9 |
| 1954 | 4.6 | 5.5 | 4.5 | 4.1 | 4.8 | 4.4 | 5.0 (5.0)* |
| 1955 | 4.0 | 4.8 | 4.8 | 2.7 | 4.5 | 5.2 | 4.6 (4.6)* |
| 1956 | 6.0 | 5.1 | 5.3 | 5.4 | 4.9 | 5.1 | 5.2 (5.2)* |
| 1957 | 5.1 | 5.3 | 4.0 | 4.1 | 5.5 | 4.7 | 5.0 (5.0)* |
| 1958 | 6.3 | 5.3 | 4.5 | 4.3 | 4.1 | 4.3 | 5.0 (4.9)* |

Continued --

Continued --

| | Glenns Ferry | Homedale | Blackfoot Reservoir | Island Park Reservoir | North Fork Snake River | North Lake | Total* |
|----------------------|-----------------|----------|------------------------|--------------------------|---------------------------|------------|----------------|
| Estimated production | | | | | | | |
| 1952 | 82 | 484 | 352 | 48 | - | - | 966 |
| 1953 | 60 | 900 | 355 | 166 | - | - | 1,481 |
| 1954 | 41 | 930 | 351 | 148 | 154 | 80 | 1,470 (1,704)* |
| 1955 | 4 | 601 | 387 | 52 | 94 | 130 | 1,044 (1,268)* |
| 1956 | 36 | 627 | 323 | 185 | 152 | 173 | 1,171 (1,496)* |
| 1957 | 41 | 1,030 | 201 | 95 | 136 | 118 | 1,367 (1,621)* |
| 1958 | 44 | 798 | 267 | 121 | 145 | 121 | 1,230 (1,496)* |

* Excluding North Fork and North Lake

()* Including North Fork and North Lake

Continued --

TABLE 3

Southcentral Idaho Duck Production Trend Routes
1957-58

| Trend Route | Year | Mallard | Redhead | Gadwall | B-W/Cinn. Teal | Baldpate | Ruddy | Total |
|----------------------------|------|---------|---------|---------|----------------|----------|-------|---------|
| Milner | 1957 | 15 | - | - | 1 | - | - | 16 |
| Canal | 1958 | 23 | 3 | - | 1 | - | - | 27 |
| Minidoka | 1957 | 7 | 5 | 6 | 0 | - | - | 18 |
| Burley | 1958 | 1 | 21 | 9 | 3 | - | 2 | 36 |
| Richfield | 1957 | 9 | - | - | - | 2 | - | 11 |
| Canal | 1958 | 2 | - | - | - | 6 | - | 8 |
| Bypass | 1957 | 9 | - | 2 | - | 3 | - | 14 |
| Canal | 1958 | 9 | - | - | - | 7 | - | 16 |
| Dietrich | 1958 | 6 | - | - | - | 5 | - | 11 |
| Canal | | | | | | | | |
| Total of Comparable Routes | | | | | | | | |
| | | | | | | | | 1957 59 |
| | | | | | | | | 1958 87 |

TABLE 4

Southeastern Idaho Duck Production Trend Routes
1953-58*

| Trend Route | Year | Number Broods By Species | | | | | | | | | | | | Total |
|----------------|------|--------------------------|---------|----------|---------|----------|----------|----------------|------------|---------|-------|---------------|--------------|-------|
| | | Mallard | Pintail | Baldpate | Gadwall | Shoveler | G-W Teal | B-W/Cinn. Teal | Canvasback | Redhead | Ruddy | Scaup, Lesser | Unidentified | |
| Camas NWR | 1953 | 9 | 4 | 1 | 7 | 1 | 1 | 1 | - | 17 | 9 | 4 | 9 | 63 |
| | 1954 | 22 | 4 | - | 9 | - | 1 | 2 | 1 | 4 | 3 | 8 | 10 | 64 |
| | 1955 | 6 | 2 | - | 8 | 2 | - | 3 | - | 3 | - | 5 | 9 | 38 |
| | 1956 | 19 | 4 | 3 | 7 | 1 | - | 1 | - | 14 | 4 | 6 | 30 | 89 |
| | 1958 | 14 | 3 | 1 | 5 | 2 | 1 | 3 | 1 | 10 | 1 | 7 | 8 | 56 |
| Blackfoot Res. | 1953 | 14 | 6 | 4 | 28 | - | 1 | - | - | - | - | 12 | 13 | 78 |
| | 1954 | 14 | 4 | 4 | 33 | - | 1 | 5 | - | 5 | - | 8 | 4 | 78 |
| | 1955 | 12 | 2 | 6 | 23 | - | 1 | 7 | - | 3 | - | 6 | 5 | 65 |
| | 1956 | 8 | - | 11 | 41 | - | - | 3 | - | - | - | 12 | 4 | 79 |
| | 1958 | 28 | 8 | 10 | 54 | - | 1 | 2 | - | 1 | - | 8 | 13 | 125 |

* No routes were censused in 1957.

IDAHO - Continued

Conclusions

It is estimated that the statewide goose production will be 8% lower than last year with a 19% increase noted in eastern Idaho. The duck flight will be slightly higher than last year.

CALIFORNIAWeather and Water Conditions

Precipitation in northeastern California was above normal for the third year and these conditions resulted in an abundance of water available during the nesting season. The water level in many reservoirs and lakes in this section was higher than ever recorded. Nesting conditions were considered to be excellent.

Late spring rains occurred throughout California and some sections including the central part received as much as twice the normal rainfall for the year. There was some flooding of rivers and streams draining into the Sacramento Valley and in the San Joaquin Valley the flooding was more extensive. The San Joaquin River flooded in several areas and water from the Kings, Tule, and Kaweah Rivers overflowed into Tulare and Hacienda Lakes. Buena Vista Lake was also partially filled. Excellent stands of barley adjacent to these flooded areas furnished good nesting cover. More water remained in the Grasslands than usual making nesting conditions quite favorable there.

Breeding Population and Production Indices

A comparative summary of nesting pairs of waterfowl for the past four seasons, together with final fall population including young plus resident adults, is shown in the following table. In almost all cases the figures shown for "nesting pairs" are more accurate than those indicating "fall population indices."

| Species | Estimated Total Nesting Pairs | | | | Fall Population Indices | | | |
|---------------|-------------------------------|---------------|---------------|---------------|-------------------------|----------------|----------------|----------------|
| | 1955 | 1956 | 1957 | 1958 | 1955 | 1956 | 1957 | 1958 |
| Canada Goose | 2,870 | 3,130 | 3,960 | 4,360 | 14,810 | 17,640 | 19,280 | 25,190 |
| Mallard | 34,500 | 29,410 | 37,470 | 31,250 | 165,360 | 136,970 | 150,540 | 146,470 |
| Pintail | 1,260 | 1,850 | 2,220 | 6,850 | 7,710 | 11,530 | 12,860 | 31,030 |
| Gadwall | 3,150 | 2,710 | 2,880 | 2,970 | 24,500 | 21,020 | 22,370 | 22,570 |
| Cinnamon Teal | 4,560 | 4,760 | 1,720 | 2,220 | 30,670 | 33,710 | 9,410 | 10,670 |
| Redhead | 4,220 | 4,430 | 2,980 | 2,670 | 35,810 | 37,790 | 24,480 | 20,900 |
| Ruddy Duck | 2,990 | 2,230 | 1,640 | 2,170 | 19,540 | 15,610 | 10,160 | 12,750 |
| Shoveler | 530 | 630 | 650 | 2,150 | 3,300 | 4,240 | 4,250 | 12,120 |
| Scaup | 180 | 340 | 550 | 710 | 1,480 | 2,590 | 4,440 | 5,730 |
| Others | 190 | 350 | 400 | 450 | 850 | 1,520 | 1,950 | 2,740 |
| TOTAL | 51,580 | 46,710 | 50,510 | 51,440 | 289,120 | 264,980 | 240,460 | 264,980 |
| Coots | 12,060 | 12,870 | 12,350 | 23,460 | 43,480 | 81,340 | 74,890 | 127,760 |

Conclusions

- (1) A 10 percent increase in nesting pairs of Canada geese and a 31 percent increase in total fall population indices. Apparently large numbers of non-breeding geese remained in the state during the moult.
- (2) An overall increase of 2 percent in breeding pairs of ducks and an increase of 10 percent in the total fall population. Pintail showed a significant increase this year throughout the state except in the Klamath Basin. Shoveler also indicated an increase throughout the state. Cinnamon teal, redheads and ruddy ducks were present in fewer numbers than normal for the second year.
- (3) An increase of 90 percent in the nesting coot population and an increase of 71 percent in total fall population indices. Ideal water conditions in the San Joaquin Valley resulted in a large build up of the nesting coot population.

NEVADAWeather and Water Conditions

Weather conditions have been favorable to waterfowl production throughout the late spring and early summer nesting period. Severe storms during March and early April increased the mountain snow pack. The water supply forecast as of April 1, 1958, indicated that this year will be the best irrigation water year since the record-breaking year of 1952. Most reservoirs were lowered in anticipation of high expected flows.

Stream flows varied from 125 percent to 177 percent of normal. All major waterfowl producing reservoirs were at or near capacity storage during the peak of the nesting season.

Breeding Population Indices

Ducks: Breeding pair counts taken at the Stillwater Wildlife Management Area show an increase of 14.7 percent over last year. There were 4,768 estimated breeding pairs using the area this year compared to 4,157 pairs in 1957. Significant increases were noticed in mallards, gadwalls, pintails and cinnamon teal. Other nesting species showed no significant change. This key area is used as an index for production trends in west-central Nevada. Species abundance presented in the following table remains fairly constant from year to year:

Species Composition of Breeding Pairs
Stillwater Wildlife Management Area

| Species | Pairs | Percent Abundance |
|-------------------|-------|-------------------|
| Redhead | 1,796 | 37.5 |
| Cinnamon Teal | 1,479 | 31.0 |
| Gadwall | 635 | 13.3 |
| Mallard | 421 | 8.7 |
| Pintail | 206 | 4.3 |
| Ruddy | 184 | 3.7 |
| Shoveler | 35 | .7 |
| Baldpate | 8 | .1 |
| Green-winged Teal | 4 | - |
| <hr/> | | |
| TOTAL | 4,768 | |

NEVADA - Continued

Production Indices

Brood surveys to determine production trends of ducks on the reservoirs of northern Nevada indicate an increase in production of about 40 percent. Good water conditions during the past two seasons have benefited production considerably in this area and good recovery is being made following the setback caused by drought during 1954, 1955 and 1956. Average size of all broods classified to date is 6.5. The average brood size last year was 6.8 birds.

Geese: Production of Canada geese in Nevada showed very little change from last year with the exception of a slight increase in the northern portion of the State. Ruby Lake National Wildlife Refuge reported a slight increase in goose production this year. Total production of Canada geese is estimated at 1,500 birds. The moulting population of Canada geese at Pyramid Lake was up 29 percent over last year. The 3,500 moulting geese at Pyramid Lake this year is the highest figure on record.

Conclusions

Breeding pair counts and early brood surveys indicate an increase in duck production of about 35 percent for the entire State. Production of Canada geese was somewhat higher than normal with total production estimated at 1,500 birds.

UTAH

On the basis of a wire from Donald A. Smith, Utah State Department of Fish and Game, the waterfowl situation in state is as follows:

The 1958 breeding ground survey in Utah was confined to a breeding pair count of ducks and a brood count of geese. Both aerial and ground counts show increase in breeding pairs of ducks. The greatest increase noted was in pintails. There was an increase in Canada goose broods observed on nearly all areas other than Bear River Refuge. There were 90 less broods counted on this area as compared to last year which affected the state total to the extent that total goose production was down 181 young as compared to 1957. Weather and water conditions have been excellent. There is an apparent increase in duck broods from 1957 but no actual count has been made.

Conclusion:

There will be an increase in ducks in Utah as compared to last year but the number of geese will remain about the same or decrease slightly.

OREGON

Weather and Water Conditions

Eastern Oregon, which contains the major waterfowl breeding grounds in the state, had ideal water conditions for waterfowl production. Heavy rains during May and June, however, were damaging to newly hatched birds.

Production Indices

Results obtained from breeding ground surveys are presented in the accompanying tables and show a five per cent increase in goose production and a 46 per cent decrease in duck production. The number of Canada geese produced on the samples is slightly above the average for the past seven years.

Duck production, according to the limited sampling, is down an indicated 46 per cent from a peak production season in 1957. Biggest decrease was registered with redheads.

An abundance of water along with a luxuriant growth of emergent vegetation created more habitat and made observations of broods difficult. These factors along with sampling 10 days earlier than in 1957, undoubtedly resulted in the reduced tally, especially with the late nesting red-head. Field biologists feel there is a decrease in duck production in Oregon but not as great as indicated in their sampling.

Conclusions

There will be a small decrease in the number of ducks produced in Oregon as compared to 1957 but the number of Canada geese will remain about the same.

WATERFOWL PRODUCTION (OREGON)

| Species | <u>Klamath Basin (37.0 Sq. Miles)</u> | | | | <u>Summer Lake (1.0 Sq. Miles)</u> | | | | <u>Silver Lake (1.0 Sq. Mile)</u> | | | |
|---------------------------|---------------------------------------|------|-----------|-------|------------------------------------|------|-----------|------|-----------------------------------|------|-----------|------|
| | No. Broods | | No. Young | | No. Broods | | No. Young | | No. Broods | | No. Young | |
| | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 |
| Mallard | 101 | 85 | 540 | 421 | 11 | 13 | 76 | 104 | 21 | 7 | 148 | 51 |
| Pintail | 2 | - | 9 | - | 5 | 6 | 36 | 51 | 4 | 2 | 20 | 18 |
| Gadwall | 10 | 17 | 53 | 103 | 10 | 17 | 84 | 136 | 13 | 4 | 97 | 34 |
| BW/Cinn Teal | 35 | 25 | 189 | 150 | 2 | 6 | 18 | 53 | 7 | 2 | 57 | 30 |
| Shoveller | - | - | - | - | 1 | - | 6 | - | - | 1 | - | 7 |
| Redhead | 687 | 253 | 4,437 | 1,414 | 14 | 26 | 107 | 184 | 5 | 3 | 40 | 22 |
| Canvasback | 3 | - | 13 | - | - | - | - | - | - | - | - | - |
| Scaup | 11 | 4 | 66 | 24 | - | - | - | - | - | - | - | - |
| Ruddy | 99 | 97 | 580 | 600 | - | 4 | - | 25 | - | 2 | - | 13 |
| Wood Duck | - | - | - | - | - | - | - | - | - | - | - | - |
| Unidentified and other | - | 6 | - | 36 | - | - | - | - | - | - | - | - |
| TOTAL DUCKS | 948 | 487 | 5,887 | 2,748 | 43 | 72 | 327 | 553 | 50 | 21 | 36 | 175 |
| Canada Goose | 233 | 244 | 1,065 | 1,182 | 79 | 74 | 337 | 343 | 71 | 58 | 306 | 248 |

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WATERFOWL PRODUCTION (OREGON)

| Species | <u>Paulina Marsh (0.75 Sq. Mile)</u> | | | | <u>Abert Lake (3.4 Sq. Miles)</u> | | | | <u>Umatilla County (4.0 Sq. Miles)</u> | | | |
|---------------------------|--------------------------------------|------|-----------|------|-----------------------------------|------|-----------|------|--|------|-----------|------|
| | No. Broods | | No. Young | | No. Broods | | No. Young | | No. Broods | | No. Young | |
| | 1957 | 1948 | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 |
| Mallard | 10 | 2 | 86 | 16 | 13 | 11 | 101 | 83 | 19 | 2 | 96 | 13 |
| Pintail | 2 | 4 | 13 | 33 | 2 | 3 | 15 | 23 | 5 | 3 | 26 | 12 |
| Gadwall | 2 | 2 | 16 | 17 | 7 | 5 | 50 | 44 | 2 | 1 | 3 | 7 |
| ♂ BW/Cinn Teal | 3 | 1 | 17 | 12 | 1 | 1 | 6 | 10 | 4 | 3 | 24 | 14 |
| Shoveller | - | - | - | - | - | - | - | - | - | - | - | - |
| Redhead | 2 | 1 | 17 | 7 | 6 | 4 | 27 | 26 | 1 | - | 4 | - |
| Canvasback | - | - | - | - | - | - | - | - | - | - | - | - |
| Scaup | - | 1 | - | 5 | - | - | - | - | - | - | - | - |
| Ruddy | - | - | - | - | 1 | 3 | 5 | 19 | - | - | - | - |
| Wood Duck | - | - | - | - | - | - | - | - | 1 | - | 1 | - |
| Unidentified and other | - | - | - | - | - | - | - | - | - | - | - | - |
| TOTAL DUCKS | 19 | 11 | 149 | 90 | 30 | 27 | 204 | 205 | 32 | 9 | 154 | 46 |
| Canada Goose | - | 6 | - | 27 | 18 | 26 | 74 | 114 | 8 | - | 28 | - |

TOTAL PRODUCTION (OREGON)
(47.15 Sq. Miles)

| Species | No. Broods | | No. Young | | |
|---------------------------|------------|------|-----------|-------|------|
| | 1957 | 1958 | 1957 | 1958 | |
| Mallard | 175 | 120 | 1,047 | 688 | |
| Pintail | 20 | 18 | 119 | 137 | |
| Gadwall | 44 | 46 | 303 | 341 | |
| BW/Cinn Teal | 52 | 38 | 311 | 269 | |
| Shoveller | 1 | 1 | 6 | 7 | |
| Redhead | 715 | 287 | 4,632 | 1,653 | |
| Canvasback | 3 | - | 13 | - | |
| Scaup | 11 | 5 | 66 | 29 | |
| Ruddy | 100 | 106 | 585 | 657 | |
| Wood Duck | 1 | - | 1 | - | |
| Unidentified and other | - | 6 | - | 36 | |
| TOTAL DUCKS | 1,122 | 627 | 7,083 | 3,817 | -46% |
| Canada Geese | 409 | 408 | 1,816 | 1,914 | + 5% |

Central Flyway Data

Waterfowl Kill Information

The following table presents the estimated number of waterfowl bagged and waterfowl knocked down but not retrieved during the 1956-57 and 1957-58 shooting seasons as determined by the Waterfowl Hunter Mail Survey:

| Species | 1957-1958 | 1956-1957 | Percent Change 1956-1957 to 1957-1958 |
|---------------------------|-----------|-----------|---|
| Mallard | 1,724,199 | 1,480,764 | / 16.43 |
| G-W. Teal | 651,708 | 405,228 | / 60.83 |
| Pintail | 434,343 | 353,088 | / 23.01 |
| B-W. Teal | 338,252 | 298,295 | / 13.40 |
| Redhead | 180,556 | 170,934 | / 5.63 |
| Canvasback | 144,135 | 144,368 | - .16 |
| Shoveler | 125,149 | 90,406 | / 38.43 |
| Gadwall | 64,318 | 89,031 | - 27.76 |
| Am. Wigeon | 50,757 | 39,033 | / 30.04 |
| Scaup | 92,990 | 34,078 | / 172.87 |
| Ruddy | 5,036 | 22,474 | - 77.59 |
| Cinn. Teal | 11,623 | 18,414 | - 37.04 |
| Bufflehead | 5,036 | 12,979 | - 61.20 |
| Wood Duck | 13,173 | 10,869 | / 21.20 |
| Ring-necked | 21,697 | 10,294 | / 110.77 |
| Merganser | 4,649 | 7,576 | - 38.64 |
| Goldeneye | 3,099 | 4,827 | - 35.80 |
| Black Duck | 2,324 | 2,462 | - 5.61 |
| Scoter | 1,549 | 543 | / 185.27 |
| Others | 00 | 1,151 | -- |
| Total Ducks Retrieved | 3,874,604 | 3,196,814 | / 21.20 |
| Total Ducks not retrieved | 681,092 | 520,847 | / 30.77 |
| Total Duck Kill | 4,555,696 | 3,717,661 | / 22.54 |
| Canada Goose* | 192,432 | 168,998 | / 13.87 |
| Snow Goose | 61,458 | 113,166 | - 45.69 |
| Blue Goose | 23,965 | 25,575 | - 6.30 |
| White-fronted Goose | 19,475 | 32,763 | - 40.56 |
| Total Geese Retrieved | 297,330 | 340,502 | - 12.68 |
| Total Geese not retrieved | 32,970 | 65,402 | - 49.59 |
| Total Goose Kill | 330,300 | 405,904 | - 18.63 |
| Total Coot Retrieved | 79,439 | 72,168 | / 10.08 |
| Total Coot not retrieved | 25,633 | 21,580 | / 18.78 |
| Total Coot Kill | 105,072 | 93,748 | / 12.08 |

* Includes all white-cheeked geese as Canada geese.

Central Flyway Data

Number of Hunters, Average Times Hunted, Seasonal Bag, Seasonal Unretrieved Kill
and Daily Bag as Determined by the Waterfowl Hunter Mail Survey

| | | 1957-1958 | 1956-1957 | Percent Change 1956-1957 to 1957-1958 |
|---|-------|-----------|-----------|---|
| Number of Potential Hunters | | | | |
| Over 15* | | 554,470 | 489,434 | / 13.29 |
| Under 16 | | 52,384 | 51,508 | N.C. |
| | | 606,854 | 540,942 | / 12.18 |
| Number of Active Hunters** | | | | |
| Over 15 | | 479,916 | 418,535 | / 14.43 |
| Under 16 | | 41,732 | 38,628 | / 8.04 |
| | | 521,648 | 457,163 | / 14.11 |
| Average Times Hunted** | | 3.933 | 4.874 | - 19.31 |
| Average Seasonal Bag** | | | | |
| <u>Over 15</u> | Ducks | 7.839 | 7.183 | / 9.13 |
| | Geese | .533 | .791 | - 32.62 |
| | Coot | .133 | .147 | - 9.52 |
| <u>Under 16</u> | Ducks | 2.695 | 4.924 | - 43.24 |
| | Geese | .093 | .244 | - 61.89 |
| | Coot | .371 | .276 | / 34.42 |
| Average Seasonal No. not retrieved** | | | | |
| <u>Over 15</u> | Ducks | 1.379 | 1.159 | / 18.98 |
| | Geese | .067 | .151 | - 55.63 |
| | Coot | .049 | .045 | / 8.89 |
| <u>Under 16</u> | Ducks | .465 | .925 | - 49.73 |
| | Geese | .021 | .056 | - 62.50 |
| | Coot | .056 | .069 | - 18.84 |
| Average Daily Bag** | | | | |
| <u>Over 15</u> | Ducks | 1.993 | 1.474 | / 35.21 |
| | Geese | .136 | .162 | - 16.05 |
| | Coot | .034 | .030 | / 13.33 |
| <u>Under 16</u> | Ducks | .685 | 1.010 | - 32.18 |
| | Geese | .024 | .050 | - 52.00 |
| | Coot | .094 | .057 | / 64.91 |

* Individuals who purchased a Duck Stamp with intent to hunt.

** Individuals who hunted at least once. 49

Winter Trend Data - Central Flyway

As mentioned previously, it was not possible for the Bureau of Sport Fisheries and Wildlife to conduct the annual survey of waterfowl wintering ground in Mexico during January 1957. Inasmuch as the East Coast and central portions of Mexico usually contain from 20 to 60 percent of the total waterfowl recorded in the Central Flyway during the winter survey there is question as to whether data recorded in the Central Flyway States only are representative of trends in wintering population. This is particularly true in view of the fact that there was a recorded decrease of about $3\frac{1}{2}$ million birds in Texas between 1956 and 1957, while between 1957 and 1958 there was an increase of about 2 million. The species involved in the change are ones regularly found wintering in Mexico and circumstantial evidence points to the possibility that there may have been a decided shift to Mexico wintering areas during 1957.

On the basis of data collected in the United States only, ducks increased 96 percent as compared to 1957, geese increased 27 percent, coot increased 248 percent, and waterfowl collectively increased 91 percent. On the same basis the species composition and percent change for individual species is presented in the following table. The following graph presents the trend in duck, goose, and coot populations for the period 1949 through 1958. The data have been adjusted so that year to year comparisons are on the basis of comparable coverage. In making the compilation it was assumed that the areas covered were representative of any change which may have occurred. This assumption is subject to the possible error outlined above particularly between 1956 and 1957 and between 1957 and 1958

Species Composition - Central Flyway - 1957 and 1958 (Comparable Coverage)

| Species | Percent of Birds Identified | | Percent Change |
|-------------------|-----------------------------|------|----------------|
| | 1957 | 1958 | |
| Mallard | 62.0 | 60.1 | / 84.6 |
| Pintail | 9.3 | 8.1 | / 64.8 |
| Snow Goose | 6.9 | 3.7 | / 1.4 |
| Redhead | 6.1 | 5.7 | / 78.6 |
| Canada Goose | 3.5 | 3.0 | / 63.1 |
| Scaup | 2.3 | 7.8 | / 545.9 |
| Baldpate | 2.0 | 2.3 | / 123.8 |
| Coot | 1.8 | 3.5 | / 274.7 |
| Green-winged Teal | 1.4 | 2.4 | / 220.9 |
| Merganser | 1.3 | .9 | / 27.1 |

Continued --

Species Composition - Central Flyway - Continued

| Species | Percent of Birds Identified | | Percent Change |
|---------------------|-----------------------------|-------|----------------|
| | 1957 | 1958 | |
| Gadwall | .9 | .7 | / 41.3 |
| Blue Goose | .8 | .7 | / 60.4 |
| White-fronted Goose | .4 | .4 | / 80.2 |
| Shoveler | .4 | .2 | / 23.8 |
| Goldeneye | .4 | .3 | / 40.1 |
| Canvasback | .2 | .1 | / 18.7 |
| Ringneck | .1 | .1 | - |
| Blue-winged Teal | .1 | Tr. | - |
| Ruddy | .1 | Tr. | - |
| Bufflehead | Tr. | Tr. | - |
| Wood Duck | Tr. | Tr. | - |
| Mottled | Tr. | Tr. | - |
| Trumpeter Swan | Tr. | Tr. | / 144.1 |
| Whistling Swan | Tr. | Tr. | - |
| <hr/> | | | |
| TOTAL | 100.0 | 100.0 | / 90.9 |

Trend in Duck, Goose, and Coot Population in Central Flyway
1949 Through 1958 (Comparable Coverage)

Percent Departure From Average

Plus

Minus

60
50
40
30
20
10
Ave.
- 10
- 20
- 30
- 40
- 50
- 60

Years

49

50

51

52

53

54

55

56

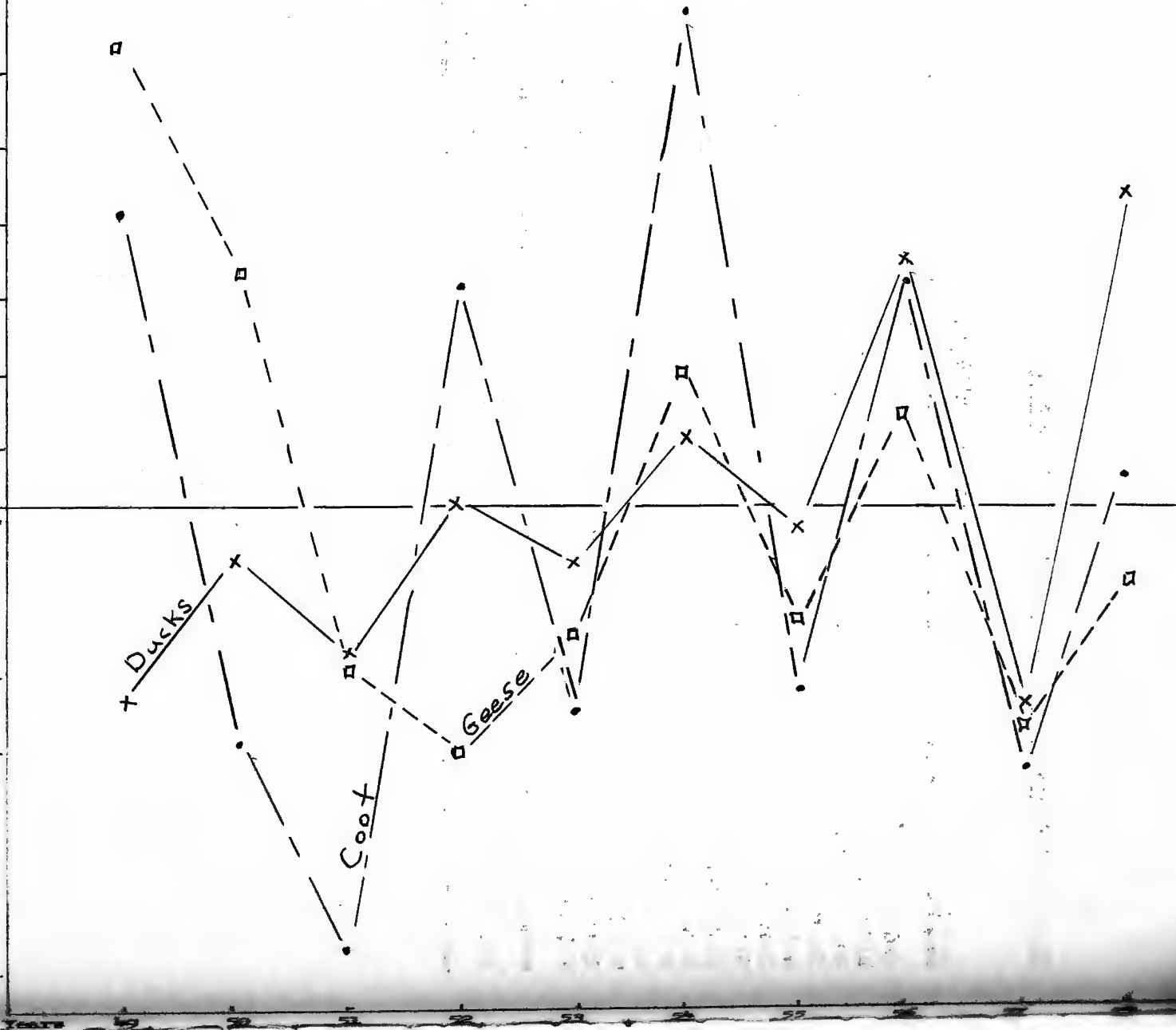
57

58

Ducks

Geese

Coot



Breeding Ground Survey Data

SOUTHERN SASKATCHEWANWeather and Water Conditions

We faced a habitat in Southern Saskatchewan this spring that was generally dry. The past winter had practically no snow. Carry-over fall moisture was sufficient for starting agriculture crops but the pond index for May 1958 was down almost 30% from the average of 1949 to 1953. Our figures show a slight increase in ponds over last year. This may be due to the change in observers or the local increases in ponds in a few isolated areas. All indications point toward a decline pond condition.

May was exceptionally dry with practically no rain throughout the southern portion of the province. A few showers did nothing for the pothole situation. In addition May was unusually warm and windy. The worst dust storms in years were noted on May 12 and 13 and again on May 17. This all added to losses in ponds.

The prolonged and increasing drouth continued through the summer months with adverse effects on waterfowl production as well as farm crops. Practically no rain fell during these months, except for occasional showers which had practically no beneficial effect for nesting waterfowl. The first general rain occurred on July 12th and 13th and left in its wake as much as four inches of moisture in a few localities. Except for the extreme southern portion of the province the results indicated $\frac{1}{2}$ to $1\frac{1}{2}$ inches of moisture.

The overall picture showed a decrease in July ponds of 39% from last year. Last year the pond index stood at 1,254,000 while this year it was at 764,900. As mentioned this was the lowest in the past seven years of which we have data for.

All strata were down from last year, the largest decline being in A-West, A-East and B-East. B-West and C showed little decline from last year. Local rain in those areas appeared to have changed the situation little from last year, when they were considered to be quite dry then. It now appears that only the deeper and more permanent type ponds will hold up for the remainder of the season.

Breeding Population Indices

The breeding population index came out to 5,193,900 for all ducks. This compares very favorably with last year. It was off about 2% which is not measurable. Actually the total number of ducks was exceeded only by the years 1955 and 1956 in the past five years.

Of particular interest was the large increase in mallards. Mallards showed a 39% increase over 1957 and the highest population ever recorded on our transect surveys. On the other hand the pintail population was off 33% from last year and down 15% from the 1949 to 1953 average. Baldpates showed a substantial increase over last year. Of the other species, and particularly divers, generally they indicated substantial decreases from last year. Table III gives a run-down on gains and losses.

May 1958 Waterfowl Population Summary - Southern Saskatchewan

| | STRATA | | | | | Province Totals |
|------------------------|-----------|-----------|-----------|---------|---------|-----------------|
| | A-East | A-West | B-East | B-West | C | |
| Area in Sq. Miles | 14,600 | 37,630 | 33,720 | 16,800 | 16,800 | 114,040 |
| Sample in Sq. Miles | 317.0 | 622.0 | 173.0 | 165.0 | 127.0 | 1404.0 |
| Ducks Actually Seen | | | | | | |
| Lone Drakes | 4,642 | 2,584 | 1,678 | 1,039 | 424 | 10,367 |
| Pairs | 2,584 | 1,257 | 577 | 382 | 197 | 4,997 |
| Flocks | 1,786 | 157 | 48 | 66 | 0 | 2,057 |
| Unidentified | 7,134 | 7,383 | 3,023 | 2,354 | 1,115 | 21,009 |
| Percent Lone Males | 77.5 | 74.8 | 82.95 | 83.21 | 76.79 | 79.5 |
| Identified Ducks Seen | 11,596 | 5,255 | 2,880 | 1,869 | 818 | 22,418 |
| Ducks Per Square Mile | 87.1 | 30.6 | 54.3 | 40.3 | 23.1 | 45.6 |
| Stratum Population | | | | | | |
| Indices | 1,270,900 | 1,152,200 | 1,832,200 | 677,700 | 260,900 | 5,193,900 |
| Coots Per Sq. Mile | 0.95 | 0.22 | 1.2 | 0.57 | 0.31 | 0.65 |
| Coots Stratum Total | 13,900 | 8,200 | 38,800 | 9,500 | 3,500 | 73,900 |
| Ponds Per Sq. Mile | 36.1 | 9.3 | 14.5 | 11.4 | 9.3 | 14.6 |
| Ponds Stratum Total | 526,500 | 350,500 | 489,600 | 191,000 | 105,100 | 1,662,700 |
| Expansion Factor | 46.06 | 60.5 | 194.91 | 101.82 | 88.9 | 81.23 |
| Linear Miles in Sample | 1,268 | 2,488 | 692 | 660 | 508 | 5,616 |

Species Indices (Aerial) - May, 1958 Waterfowl Population, Southern Saskatchewan

| Species | STRATA | | | | | Province Totals |
|------------------------|-----------|-----------|-----------|---------|---------|-----------------|
| | A-East | A-West | B-East | B-West | C | |
| Pintail | 120,700 | 258,100 | 245,500 | 73,900 | 91,100 | 789,300 |
| Mallard | 786,700 | 678,600 | 1,189,100 | 384,900 | 125,800 | 3,165,100 |
| Baldpate | 85,200 | 50,700 | 88,000 | 42,700 | 9,100 | 275,700 |
| Shoveler | 24,100 | 54,100 | 95,300 | 23,000 | 16,700 | 213,200 |
| Gadwall | 5,100 | 13,800 | 22,000 | 8,800 | 4,200 | 53,900 |
| Blue-winged Teal | 133,400 | 19,600 | 34,800 | 12,200 | 7,000 | 207,000 |
| Green-winged Teal | 7,600 | 1,200 | 7,300 | 7,500 | 500 | 24,100 |
| Cinnamon Teal | - | - | - | - | 500 | 500 |
| <hr/> | | | | | | |
| Subtotal Surface Ducks | 1,162,800 | 1,076,100 | 1,682,000 | 553,000 | 254,900 | 4,728,800 |
| <hr/> | | | | | | |
| Scaup | 45,800 | 41,500 | 69,700 | 51,500 | 5,500 | 214,000 |
| Canvasback | 48,300 | 25,300 | 42,200 | 41,300 | 500 | 157,600 |
| Redhead | 11,400 | 6,900 | 23,800 | 16,900 | - | 59,000 |
| Ruddy | - | 1,200 | 7,300 | 4,100 | - | 12,600 |
| Ringneck | 1,300 | 1,200 | 1,800 | 1,400 | - | 5,700 |
| Goldeneye | - | - | 1,800 | 3,400 | - | 5,200 |
| Bufflehead | 1,300 | - | 1,800 | 2,700 | - | 5,800 |
| Scoter | - | Trace | 1,800 | 3,400 | - | 5,200 |
| <hr/> | | | | | | |
| Subtotal Divers | 108,100 | 76,100 | 150,200 | 124,700 | 6,000 | 465,100 |
| <hr/> | | | | | | |
| GRAND TOTAL DUCKS | 1,270,900 | 1,152,200 | 1,832,200 | 677,700 | 260,900 | 5,193,900 |
| <hr/> | | | | | | |
| Coots | 13,900 | 8,200 | 38,800 | 9,500 | 3,500 | 73,900 |
| <hr/> | | | | | | |
| Ponds | 526,500 | 350,500 | 489,600 | 191,000 | 105,100 | 1,662,700 |

Comparative Indices - May Waterfowl Population - Southern Saskatchewan
(From Air Surveys)

| | 1949-1953 | 1954 | 1955 | 1956 | 1957 | 1958 |
|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Pintail | 923,900 | 1,275,000 | 1,774,100 | 1,969,500 | 1,185,300 | 789,300 |
| Mallard | 1,186,400 | 1,912,100 | 2,032,600 | 2,473,200 | 2,273,700 | 3,165,100 |
| Baldpate | 183,100 | 182,100 | 235,800 | 301,100 | 204,200 | 275,700 |
| Shoveler | 200,600 | 288,400 | 351,500 | 389,800 | 308,800 | 213,200 |
| Gadwall | 79,100 | 85,400 | 108,800 | 111,100 | 125,000 | 53,900 |
| Blue-winged Teal | 161,700 | 263,900 | 375,500 | 384,600 | 309,700 | 207,000 |
| Green-winged Teal | 22,400 | 18,700 | 52,500 | 61,800 | 33,300 | 24,100 |
| Black Duck | Trace | - | Trace | - | 1,500 | - |
| Cinnamon Teal | - | - | - | - | - | 500 |

| | | | | | | |
|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Subtotal Surface Ducks | 2,757,200 | 4,025,600 | 4,930,800 | 5,691,100 | 4,441,500 | 4,728,800 |
|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|

| | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|
| Scaup | 146,200 | 209,600 | 459,700 | 551,600 | 455,000 | 214,000 |
| Canvasback | 123,200 | 166,600 | 177,600 | 223,300 | 214,900 | 157,600 |
| Redhead | 38,300 | 73,400 | 85,400 | 153,300 | 112,400 | 59,000 |
| Ringneck | 8,600 | 5,600 | 19,800 | 9,200 | 4,600 | 5,700 |
| Ruddy | 21,500 | 15,000 | 47,700 | 46,700 | 34,300 | 12,600 |
| Goldeneye | 8,700 | 7,600 | 4,800 | 15,800 | 7,900 | 5,200 |
| Bufflehead | 10,700 | 4,600 | 8,900 | 7,100 | 15,600 | 5,800 |
| Scoter | 46,000 | 75,500 | 9,400 | 16,000 | 900 | 5,200 |
| Merganser | Trace | - | - | - | - | - |

| | | | | | | |
|-----------------|---------|---------|---------|-----------|---------|---------|
| Subtotal Divers | 403,200 | 557,900 | 813,300 | 1,023,000 | 845,600 | 465,100 |
|-----------------|---------|---------|---------|-----------|---------|---------|

| | | | | | | |
|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| GRAND TOTAL DUCKS | 3,160,400 | 4,583,500 | 5,744,100 | 6,714,100 | 5,287,100 | 5,193,900 |
|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|

| | | | | | | |
|-------|--------|---------|---------|---------|---------|--------|
| Coots | 87,500 | 140,200 | 201,500 | 306,500 | 241,900 | 73,900 |
|-------|--------|---------|---------|---------|---------|--------|

| | | | | | | |
|-------|-----------|-----------|-----------|-----------|-----------|-----------|
| Ponds | 2,325,000 | 4,264,400 | 4,033,200 | 2,488,900 | 1,444,900 | 1,662,700 |
|-------|-----------|-----------|-----------|-----------|-----------|-----------|

Notes: A - First and last populations in 1954, 5 and 6 only.

SOUTHERN SASKATCHEWAN - Continued

Production Indices

The 1958 brood index was 253,100 as compared to 615,800 in 1957 (- 59%). Stratum A-West was down 76%, the largest drop, while A-East showed the least loss, only 18%.

Numbers of ducklings per brood was also down, in fact at an all time low of 4.3 ducklings per class III brood. Taking class II and III broods together the figure indicated 4.16 ducklings per brood, also an unusually low number.

The coot brood index was off 92% by our aerial methods. Coot population and production figures have always left much to be desired from aerial surveys. However, to the best of our knowledge coot production will be down in this area, although it may not be off as much as the figures indicate.

The early nesters as indicated reached a hatching peak in late May. However, re-nesting attempts appear to have continued and at present a number of broods are still coming off. Of the broods observed and classified this year they fell into this category: Class I's 33.6%; Class II's 44.0%; and Class III's 22.4%. Last year this breakdown showed broods to be thus: Class I's 25.2%; Class II's 32.1%; and Class III's 42.5%. This would indicate for this year a fairly poor success of early nesters and better success on re-nesting and later nesting species. The late nesting index in 1958 stood at 264% above 1957. This index was stronger than any previous year in the last seven years except 1955. It is doubted that the index this year of 388,500 should be considered a balancing effect to brood losses. It no doubt will assist in offsetting some previous losses. However, it should be remembered that with the declining water conditions these late nesters and re-nesters are up against the same perils as confronted the early nesters and their success will probably be no better.

Comparative Data - July 1958 - Aerial Surveys - Southern Saskatchewan

| | 1957 | 1958 | % Change |
|------------------------|-----------|---------|----------|
| Broods Per Square Mile | 5.4 | 2.22 | - 58.9 |
| Brood Index | 615,839 | 253,135 | - 58.9 |
| PLB Per Square Mile | 0.95 | 3.47 | 264.3 |
| Late Nesting Index | 108,562 | 395,500 | 264.3 |
| Pond Per Square Mile | 10.99 | 6.71 | - 39.0 |
| Pond Index | 1,254,010 | 764,942 | - 39.0 |
| Coot Brood Index | 254,178 | 21,597 | - 91.5 |

Broods Per Square Mile

| | | | |
|----|------|------|--------|
| AW | 4.26 | 1.02 | - 76.1 |
| AE | 5.81 | 4.77 | - 17.9 |
| BE | 8.02 | 2.74 | - 65.8 |
| BW | 4.12 | 2.73 | - 33.7 |
| C | 2.27 | 0.61 | - 73.1 |

PLB Per Square Mile

| | | | |
|----|------|------|---------|
| AW | 0.87 | 2.10 | / 141.4 |
| AE | 2.33 | 8.01 | / 243.8 |
| BE | 0.89 | 3.55 | / 298.9 |
| BW | 0.50 | 3.71 | / 642.0 |
| C | 0.20 | 1.54 | / 670.0 |

Ponds Per Square Mile

| | | | |
|----|-------|-------|--------|
| AW | 6.65 | 3.77 | - 43.5 |
| AE | 27.63 | 14.57 | - 47.3 |
| BE | 12.98 | 7.94 | - 38.8 |
| BW | 7.10 | 6.50 | - 8.5 |
| C | 3.13 | 2.99 | - 4.5 |

Coot Brood Per Square Mile

| | | | |
|----|------|------|--------|
| AW | 1.24 | 0.04 | - 96.8 |
| AE | 0.59 | 0.27 | - 54.2 |
| BE | 4.90 | 0.24 | - 95.1 |
| BW | 1.54 | 0.41 | - 73.4 |
| C | 0.25 | 0.02 | - 92.0 |

Brood and Late Nesting Indices (Aerial) - Southern Saskatchewan, July Survey, 1958

| | Species | STRATA | | | | | Province Totals |
|--------------------------|-------------------|---------|---------|---------|---------|--------|-----------------|
| | | A-West | A-East | B-East | B-West | C | |
| Broods | Not Speciated | 38,357 | 69,635 | 92,390 | 45,819 | 6,934 | 253,135 |
| 65 Late nesting index | Pintail | 3,900 | 9,000 | 13,500 | 4,800 | 700 | 31,900 |
| | Mallard | 41,300 | 40,300 | 59,000 | 33,000 | 9,000 | 182,600 |
| | Baldpate | 2,900 | 11,700 | 6,700 | 1,900 | - | 23,200 |
| | Shoveler | 500 | 4,200 | 1,700 | 3,800 | 700 | 10,900 |
| | Gadwall | 7,300 | 1,800 | 1,700 | 3,800 | 2,100 | 16,700 |
| | Blue-winged Teal | 8,200 | 29,500 | 11,800 | - | 700 | 50,200 |
| | Green-winged Teal | - | 1,500 | 1,700 | 900 | - | 4,100 |
| | Subtotal Paddlers | 64,100 | 98,000 | 96,100 | 48,200 | 13,200 | 319,600 |
| | Scaup | 12,100 | 9,700 | 6,700 | 4,800 | 2,100 | 35,400 |
| | Canvasback | 1,500 | 2,100 | 3,400 | - | 700 | 7,700 |
| | Redhead | 500 | 2,700 | 5,000 | - | - | 8,200 |
| | Ringneck | - | 1,200 | - | 900 | 700 | 2,800 |
| | Ruddy | 900 | 3,300 | 8,500 | 7,500 | 700 | 20,900 |
| | Goldeneye | - | - | - | - | - | - |
| | Bufflehead | - | - | - | - | - | - |
| | Scoter | - | - | - | 900 | - | 900 |
| | Subtotal Divers | 15,000 | 19,000 | 23,600 | 14,100 | 4,200 | 75,900 |
| | GRAND TOTAL DUCKS | 79,100 | 117,000 | 119,700 | 62,300 | 17,400 | 395,500 |
| | Coot Broods | 1,331 | 3,960 | 8,186 | 7,942 | 178 | 21,597 |
| | Pond Index | 141,812 | 212,774 | 267,423 | 109,151 | 33,782 | 764,942 |

Comparative Brood and Late-Nesting Indices (Aerial) - Southern Saskatchewan, July Survey 1953-58

| | | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 |
|----------------------------|-------------------|-----------|-----------|-----------|-----------|-----------|---------|
| Broods | Species | | | | | | |
| | Not Speciated | 183,600 | 100,400 | 317,400 | 422,200 | 615,839 | 253,135 |
| 09 Late Nesting Indices | Pintail | 32,900 | 11,500 | 79,400 | 18,200 | 5,385 | 31,900 |
| | Mallard | 107,900 | 82,900 | 180,400 | 79,700 | 41,507 | 182,600 |
| | Baldpate | 21,100 | 17,000 | 21,300 | 12,000 | 4,012 | 23,200 |
| | Shoveler | 13,400 | 5,200 | 22,800 | 12,000 | 2,243 | 10,900 |
| | Gadwall | 14,800 | 13,800 | 28,500 | 16,400 | 3,460 | 16,700 |
| | Blue-winged Teal | 35,400 | 24,100 | 77,600 | 54,300 | 11,767 | 50,200 |
| | Green-winged Teal | 3,500 | 5,500 | 8,000 | 2,200 | 1,381 | 4,100 |
| | Subtotal Paddlers | 229,000 | 160,000 | 418,000 | 194,800 | 69,755 | 319,600 |
| | Scaup | 28,500 | 11,300 | 4,300 | 26,200 | 27,504 | 35,400 |
| | Canvasback | 15,700 | 2,700 | 15,500 | 7,300 | 1,707 | 7,700 |
| | Redhead | 8,000 | 4,200 | 8,400 | 10,500 | 1,943 | 8,200 |
| | Ringneck | 3,000 | 4,500 | 3,700 | 100 | 204 | 2,800 |
| | Ruddy | 14,000 | 18,000 | 20,000 | 21,300 | 7,449 | 20,900 |
| | Goldeneye | - | - | - | - | - | - |
| | Bufflehead | 500 | - | 900 | - | - | - |
| | Scoter | 2,500 | 1,200 | 44,100 | 900 | - | 900 |
| | Subtotal Divers | 72,200 | 43,700 | 96,900 | 66,300 | 38,807 | 75,900 |
| | GRAND TOTAL DUCKS | 301,200 | 203,700 | 514,900 | 261,100 | 108,562 | 395,500 |
| | Coot Broods | 8,380 | 4,400 | 21,000 | 81,800 | 254,178 | 21,597 |
| | Pond Index | 2,551,400 | 3,307,100 | 3,793,700 | 1,753,200 | 1,254,010 | 764,942 |

SOUTHERN SASKATCHEWAN - Continued

Conclusions

All indications point to the poorest flight from Saskatchewan in the past six years.

It is difficult to make forecasts on individual species production due to the inadequacies of the July production survey methods. However, considering May breeding population indices and production success, it appears that the mallards flight will not be in too bad a shape; divers indicate a continuous major decline and other species indicate losses.

WYOMING

Weather and Water Conditions

The nesting season of 1957 was characterized by wet weather and high water. The picture was somewhat different in 1958 for in the stock-pond country of northeastern Wyoming surface water was below normal. However, other areas compensated to some degree. For example, on the Laramie Plains of southern Wyoming an abundance of water areas was carried over from the summer of 1957.

Throughout the remainder of the state water areas appeared to be about normal.

Runoff from the mountains varied from above normal in some regions to way below in others. The runoff in most areas was about two weeks early this year and was not considered to be as lengthy as in 1957.

Summer rains have maintained most brooding habitat at a normal level.

Breeding Population Indices

Table I presents a summary of the duck breeding ground survey for 1958. The estimated breeding pair population for 1958 falls 13.97 below the number recorded for 1957. However, the estimated population is up some 6.9% from the four-year average.

In computing the total duck population during the nesting season we have combined the breeding pairs with birds that were found in groups. It will be seen in Table I that the total population for 1958 is 23.2% greater than 1957 and 9.5% greater than the four-year average. Undoubtedly many of the birds which are placed in the group category are potential nesters which move into the higher elevations as the country opens up. Unfortunately at this time we have no way of measuring how many of these birds do this.

Table 2 shows the long-term breeding ground trend for Wyoming geese. For the state as a whole there is no change from 1957 numbers and the state-wide total is 14 per cent below the long-term average. Attention is directed to the two Wyoming drainages which have been down in recent years (the Green and the North Platte). The 1958 count on the Green River registered no change from the levels of 1956 and 1957 and was 26 per cent below the long-term average. The North Platte drainage showed a substantial increase over the all-time low of 1957 and is now 20 per cent below the long-term average. Both of these drainages are still far below the levels existing prior to the beginning of the recent downward trend.

Production Data

Brood survey routes for geese and ducks have not yet been established in Wyoming. However, in Table III a comparison is made of brood counts on the Hutton Lake Refuge for the past two years. It is felt that these data are quite representative of the production areas on the Laramie Plains. It will be seen in Table III that in 1958 the number of observed broods increased as did the average brood size. Brood count data are not available for the remainder of Wyoming.

Conclusions

It appears from the data available that the fall flight of ducks from Wyoming will be about the same as 1957 and somewhat greater than the flights of 1955 and 1956. The fall flight of geese will be about the same as 1957 but somewhat below the long-term average.

TABLE I

SUMMARY OF DUCK BREEDING GROUND SURVEY

WYOMING 1957 - 1958

| Species | Pairs | | Estimated Population | | Total | | % Change | | % Change From | |
|--------------|--------|--------|-----------------------|---------------------------------|---------|---------|-----------|--|----------------|--|
| | 1957 | 1958 | % Change From 1957 | % Change From 4-year Average | 1957 | 1958 | From 1957 | | 4-year Average | |
| Mallard | 40,424 | 32,946 | - 18.5 | / .3 | 85,405 | 77,081 | - 9.8 | | / 1.2 | |
| Pintail | 9,435 | 11,020 | / 16.8 | /43.9 | 18,874 | 31,335 | / 66.0 | | /64.4 | |
| Teal | 8,020 | 7,347 | - 8.4 | /10.4 | 9,807 | 15,117 | / 54.2 | | /17.0 | |
| Shoveller | 4,721 | 3,298 | - 30.1 | - 8.2 | 5,274 | 7,395 | / 40.2 | | - 1.3 | |
| Gadwall | 2,240 | 3,077 | / 37.4 | /18.8 | 3,436 | 6,157 | / 79.2 | | / 9.9 | |
| Baldpate | 6,243 | 3,781 | - 39.4 | /10.7 | 7,479 | 7,894 | / 5.6 | | /28.0 | |
| Redhead | 236 | 268 | / 13.6 | -47.3 | 247 | 533 | / 115.8 | | -45.6 | |
| Coot | 4,127 | 1,569 | - 62.0 | - 7.0 | 4,293 | 3,405 | - 20.6 | | -20.2 | |
| A. Merganser | 1,772 | 1,890 | / 7.0 | /58.7 | 2,701 | 4,919 | / 82.2 | | /80.8 | |
| Ruddy | 0 | 107 | /107.0 | / 4.0 | 0 | 860 | / 860.0 | | -21.1 | |
| Scaup | 354 | 214 | - 39.5 | -35.2 | 373 | 430 | / 15.2 | | -33.7 | |
| Unkown | 236 | 1,514 | /541.5 | -45.1 | 1,414 | 16,853 | /1,090.0 | | -14.8 | |
| | 77,808 | 67,031 | - 13.9 | / 6.9 | 139,303 | 171,979 | / 23.2 | | / 9.3 | |

TABLE II
SUMMARY OF CANADA GOOSE BREEDING GROUND SURVEY
WYOMING 1952-1958

| Drainage | Total Number of Geese | | | | | | | Average | Per cent Change | |
|---|-----------------------|-------|-------|-------|-------|------|------|---------|-----------------|--------------|
| | 1952 | 1953 | 1954 | 1955 | 196 | 1957 | 1958 | | From 1957 | From Average |
| Snake River | 334 | 506 | 267 | 437 | 347 | 350 | 208 | 350 | - 41 | - 41 |
| Bear River | 361 | 369 | 183 | 270 | 264 | 299 | 331 | 299 | / 11 | / 11 |
| Green River | 360 | 336 | 204 | 119 | 160 | 162 | 161 | 215 | 0 | - 26 |
| 59 North Platte River | - | 509 | 296 | 219 | 147 | 81 | 194 | 241 | /140 | - 20 |
| Wind River | - | 13 | 103 | 97 | 88 | 90 | 90 | 80 | 0 | / 12 |
| Totals | - | 1,733 | 1,053 | 1,142 | 1,006 | 982 | 984 | 1,150 | 0 | - 14 |
| Combined Green and North Platte Rivers: | | | | | | | | | | |
| | - | 845 | 500 | 338 | 307 | 243 | 355 | 431 | / 46 | - 18 |

TABLE III*

Brood Counts

Hutton Lake Refuge

Albany County, Wyoming

| Species | No. Broods | <u>1957</u> | Av. Brood Size | No. Broods | <u>1958</u> | Av. Brood Size |
|---------------|------------|-------------|----------------|------------|-------------|----------------|
| | | Total Young | | | Total Young | |
| Mallard | 18 | 106 | | 25 | 215 | |
| Gadwall | 2 | 12 | | 5 | 43 | |
| Baldpate | 3 | 12 | | 8 | 57 | |
| Pintail | 6 | 38 | | 7 | 60 | |
| GW-Teal | 2 | 13 | | 1 | 7 | |
| BW-Teal | 3 | 14 | | 30 | 238 | |
| Cinnamon Teal | | | | 1 | 9 | |
| Shoveler | 3 | 12 | | 5 | 18 | |
| Redhead | 3 | 17 | | 6 | 42 | |
| Canvasback | 4 | 23 | | 10 | 63 | |
| Ruddy | 3 | 30 | | 4 | 28 | |
| Total | 47 | 277 | 5.87 | 102 | 780 | 7.65 |

*Data furnished through courtesy of Hutton Lake Wildlife Refuge Manager.

NORTH DAKOTAWeather and Water Conditions

Field conditions, Statewide were advanced during May. It was noted that extremes in conditions existed over the State. Field work in some sections was hampered by too much temporary surface water. This condition existed in the southeast and east-central sections of the State. Elsewhere, top soil moisture was needed. Several days of intense winds served to intensify the need for rainfall to an acute stage. Wind erosion more than drouth caused some reseeding. Damage to soil by winds was limited to areas of light soil.

Relief came to crops and range land in late May and June. Light to heavy rains did improve the crop outlook. June was cool and shower activity continued to blanket the State.

Local severe hail storms in some sections of North Dakota may have caused considerable damage to broods.

Interesting to note is the increase of water areas per square mile in July 1958 compared to 1957. (See aerial data summary) Heavy rains in the East and Central Stratum gave temporary relief. Pot holes that were dry in May held some water in July. Late nesting, or broods may have been given relief in areas of critical water levels.

Breeding Population Indices1958 Breeding Population Indices by Strata

| Species | Strata | | | | | | Total | |
|------------|--------|-----|---------|----|--------|-----|---------|-----|
| | West | | Central | | East | | | |
| | No. | % | No. | % | No. | % | No. | % |
| Pintail | 6,556 | 23 | 66,621 | 19 | 7,233 | 24 | 80,410 | 20 |
| Mallard | 17,044 | 59 | 126,562 | 36 | 9,644 | 32 | 153,250 | 38 |
| Baldpate | - | - | 11,611 | 3 | - | - | 11,611 | 3 |
| Shoveler | - | - | 20,144 | 6 | 1,206 | 4 | 21,350 | 5 |
| Gadwall | - | - | 21,472 | 6 | 6,028 | 20 | 27,500 | 7 |
| B-W Teal | 5,244 | 18 | 70,643 | 20 | 3,616 | 12 | 79,503 | 19 |
| G-W Teal | - | - | 909 | TR | - | - | 909 | TR |
| Scaup | - | - | 4,476 | 1 | - | - | 4,476 | 1 |
| Canvasback | - | - | 21,018 | 6 | 2,411 | 8 | 23,429 | 6 |
| Redhead | - | - | 5,805 | 2 | - | - | 5,805 | 1 |
| Ruddy | - | - | 455 | TR | - | - | 455 | TR |
| TOTAL | 28,844 | 100 | 349,716 | 99 | 30,138 | 100 | 408,698 | 100 |

NORTH DAKOTA--Continued

Comparison of the 1958 Aerial Survey Data with that of 1957*

| Stratum | Duck Population Index | | Coot Index | | Pond Index | |
|---------|-----------------------|---------|------------|--------|------------|---------|
| | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 |
| West | 26,389 | 28,844 | 0 | 920 | 33,140 | 49,710 |
| Central | 401,796 | 349,716 | 10,908 | 22,424 | 160,218 | 180,520 |
| East | 10,664 | 30,138 | 0 | 2,705 | 18,281 | 30,910 |
| TOTAL | 438,849 | 408,698 | 10,908 | 26,049 | 211,639 | 261,140 |

Percent of change
of the 1958 index
from that of 1957

-6.87

/138.81

/23.39

*The 1957 data was reworked to make it comparable to the 1958 data.

Production Indices

Summary of Air Data - July, 1958

North Dakota Aerial Survey

| | West | Central | East | State Total |
|--------------------------------|--------|---------|--------|-------------|
| Size in Square Miles | 23,474 | 33,861 | 13,330 | 70,665 |
| Sample Size in Square Miles | 38 | 150 | 17 | 205 |
| Broods Actually Seen | 3 | 131 | 2 | 136 |
| Broods/Square Mile | .08 | .87 | .12 | .7 |
| Brood Index | 1.878 | 29.459 | 1.600 | 32.937 |
| Sample Late Nesting Index | 1 | 93 | 4 | 98 |
| Late Nesting Index/Square Mile | .03 | .62 | .24 | .48 |
| Late Nesting Index | 704 | 20,994 | 3,199 | 24,897 |
| Ponds Actually Seen | 106 | 761 | 78 | 945 |
| Ponds Per Square Mile | 2.8 | 5.1 | 4.6 | 4.6 |
| Pond Index | 65,727 | 172,691 | 61,318 | 299,736 |
| Coot Brood Seen | 0 | 23 | 0 | 23 |
| Coot Brood/Square Mile | 0 | .15 | 0 | .15 |
| Coot Brood Index | 0 | 5,079 | 0 | 5,079 |

NORTH DAKOTA--ContinuedLate Nesting Index

| Species | West | Central | East | State | % Comp. |
|------------------|------|---------|-------|--------|---------|
| Mallard | -- | 8,250 | 3,199 | 11,449 | 46.0 |
| Baldpate | -- | 756 | -- | 756 | 3.0 |
| Shoveler | -- | 756 | -- | 756 | 3.0 |
| Gadwall | -- | 4,493 | --- | 4,493 | 18.1 |
| Blue-winged Teal | -- | 6,004 | -- | 6,004 | 24.1 |
| Scaup | -- | 735 | -- | 735 | 3.0 |
| Unidentified* | 704 | -- | -- | 704 | 2.8 |
| TOTAL | 704 | 20,994 | 3,199 | 24,897 | 100.0 |

*None of the late nesting ducks were identified in the West Stratum.

| Brood Size Class | Observed in Sample | | Index | | Average Size |
|---------------------|--------------------|-------------|----------|-------------|--------------|
| | # Broods | # Ducklings | # Broods | # Ducklings | |
| II | 43 | 245 | 10,681 | 60,882 | 5.7 |
| III | 59 | 334 | 14,293 | 81,470 | 5.7 |

Comparison of 1957-1958 Mid-July Aerial Survey
in North Dakota

| | 1957 | 1958 | % Change |
|----------------------|---------|---------|----------|
| Broods Actually Seen | 140 | 136 | |
| Broods/Square Mile | .7 | .7 | |
| Brood Index | 39,250 | 32,937 | - 16% |
| Late Nesting Index | 46,845 | 24,897 | - 47 |
| Pond Index | 198,755 | 299,736 | + 51 |
| Coot Brood Index | 11,445 | 5,079 | - 56 |

Average Brood Size

| | | | |
|-----------|-----|-----|------|
| Class II | 5.1 | 5.7 | + 12 |
| Class III | 5.2 | 5.7 | + 10 |

Conclusions

Total waterfowl reproduction in 1958, in North Dakota should be similar or slightly below the waterfowl reproduced in 1957.

SOUTH DAKOTA

Weather and Water Conditions

During May, water conditions were characterized by a general dryness, with a spotty distribution of water areas. South Dakota received very little snow during the winter of 1957-1958; consequently no spring run-off occurred to fill the potholes. Very good water area densities were found in the northwestern quarter of Stratum No. 2, and this apparently was due to heavy local rains which occurred there in late April. Over most of the remainder of the State many potholes were dry at the end of the May survey period. Lake Preston was dry and cultivation of the lake bottom had begun.

By June 1st scattered rains began and continued generally over the State through mid-July. The greatest rainfall during this period occurred west of the Missouri River and in the north-central and north-eastern part of the State. Temperatures for the period were well below normal. During the last two weeks of July temperatures continued below normal precipitation was light.

As of August 1, South Dakota was 5" below normal rainfall. However, cool weather had reduced water losses that would have normally occurred and the present state-wide water conditions are moderately good. The most favorable conditions exist west of the Missouri River. and in the north-central part of the State.

Usually the July water area index is lower than that of May. This was true in Stratum 2 where a decrease of 15% was observed. In the remaining two strata increases were noted of 40% in Stratum 1 and of over 200% in Stratum 3 (West River).

Breeding Population Indices

Although the pond density dropped from the previous year, the waterfowl breeding population increased somewhat. The population and the water situation is still considerably below the average of 1950-1956. The species composition as presented in the accompanying table was taken entirely from the aerial data. This differs markedly from the composition obtained by ground observations during previous years, as is to be expected. Since this difference exists, no application should be attempted using this species composition breakdown.

South Dakota Waterfowl Breeding Population Survey - May 1958

| | STRATA | | | Total |
|-----------------------|---------|---------|---------|---------|
| | 1 | 2 | 3 | |
| Sample Population | 674 | 4,753 | 1,011 | |
| Sample Size (sq. mi.) | 112.7 | 526.5 | 214.25 | |
| Strata Area (sq. mi.) | 21,481 | 25,591 | 26,598 | |
| Expansion Factor | 190 | 48.6 | 124.1 | |
| Population Index | 128,050 | 231,000 | 125,450 | 484,500 |
| Ducks/sq. mi. | 5.9 | 9.0 | 4.7 | 6.6 |

| Species Comp. | Number | % | Number | % | Number | % | Number | % |
|---------------|---------|-----|---------|-----|---------|-----|---------|-----|
| Pintail | 32,000 | 25 | 55,450 | 24 | 40,150 | 32 | 127,600 | 26 |
| Mallard | 60,150 | 47 | 106,250 | 46 | 70,250 | 56 | 236,650 | 49 |
| Shoveler | 7,700 | 6 | 23,100 | 10 | 5,000 | 4 | 35,800 | 7 |
| Gadwall | - | - | 2,300 | 1 | - | - | 2,300 | 1 |
| B-W Teal | 26,900 | 21 | 34,650 | 15 | 8,800 | 7 | 70,350 | 14 |
| Scaup | - | - | 2,300 | 1 | 1,250 | 1 | 3,550 | 1 |
| Redhead | 1,300 | 1 | 2,300 | 1 | - | - | 3,600 | 1 |
| Ruddy | - | - | 4,650 | 2 | - | - | 4,650 | 1 |
| | 128,050 | 100 | 231,000 | 100 | 125,450 | 100 | 484,500 | 100 |

Percent Lone Drakes

| | | | | |
|----------|------|------|------|------|
| Pintail | 84.3 | 26.0 | 17.6 | 37.9 |
| Mallard | 59.2 | 74.0 | 58.0 | 65.5 |
| B-W Teal | 42.0 | 40.7 | 18.0 | 38.1 |

For Survey Area

| | | | | |
|---------------|--------|---------|--------|---------|
| Coot Index | 0 | 1,263 | 248 | 1,511 |
| Pond Index | 69,540 | 139,190 | 60,809 | 269,539 |
| Ponds/sq. mi. | 3.2 | 5.4 | 2.3 | 3.65 |

Comparison of Waterfowl Breeding Populations and
Water Areas in South Dakota - 1950 to 1958

| Item | 1957 | 1958 | Percent Change | 1950-1956 Average | Percent Difference |
|------------------|---------|---------|-------------------|----------------------|-----------------------|
| Population Index | 399,300 | 484,519 | ✓ 21.4 | 660,700 | - 26.6. |
| Ponds/sq. mi. | 5.04 | 3.65 | - 27.5 | 4.8 | - 24.0 |
| Ducks/ sq. mi. | 5.34 | 6.6 | - | 9.26 | - 28.7 |

Production Indices

The observed brood density measured in broods per square mile is above 1957 by 25% (0.4 to 0.5) but still below the 1953-1956 average of 0.533 broods/sq. mile. The number of July water areas per square mile has also increased from 1957. It is impossible to demonstrate this precisely because of differences in strata boundaries existing between the State survey of last year and the survey of 1958. However, the increase is believed to be approximately 50% in eastern South Dakota.

The late nesting index indicates a large number of broods yet to come off the nest. Apparently this July survey was conducted below the peak of hatching and about 60% of the broods were yet to be produced. Blue-winged teal will compose over 40% of these potential later broods.

South Dakota - July Survey

Brood Index

| | Stratum 1 | Stratum 2 | Stratum 3 |
|--|-----------|-----------|-----------|
| | 5,712 | 17,654 | 14,661 |
| Total 38,027 (Square miles) broods/sq. mi. ■ 0.51 | | | |

South Dakota - July Survey - Continued

| <u>Late Nesting Index</u> | | | | |
|---------------------------|---------------|---------------|---------------|---------------|
| Species | Stratum 1 | Stratum 2 | Stratum 3 | State Total |
| Pintail | - | 2,910 | 745 | 3,655 |
| Mallard | - | 9,118 | 9,194 | 18,312 |
| Shoveler | 1,523 | 970 | 745 | 3,238 |
| Gadwall | - | 485 | - | 485 |
| B-W Teal | 4,950 | 16,005 | 3,727 | 24,682 |
| Redhead | - | 1,940 | - | 1,940 |
| Ruddy | 4,950 | 2,425 | - | 7,375 |
| TOTAL | 11,423 | 33,853 | 14,411 | 59,687 |
| Coot Broods | 381 | 2,619 | - | 3,000 |
| Pond Index | 94,438 | 120,280 | 187,866 | 402,584 |
| Ponds/sq. mi. | 4.5 | 4.7 | 7.1 | 5.4 |

Conclusions

In view of the increase in breeding population and broods it is concluded that there will be a moderate increase in the fall flight of ducks from South Dakota as compared to 1957.

COLORADO

Weather and Water Conditions

Weather and water conditions in Colorado during the spring and early summer were considered good to excellent for waterfowl nesting and production. In general, water levels in eastern Colorado and the San Luis Valley were far above average, and the rest of the State was at least on a par with past years. All of this was due to a combination of good spring precipitation, continuing early summer rains, and a normal snowpack which provided ample water to all areas..

The writers believe that over-all weather and water conditions in Colorado were and are highly favorable for waterfowl production and brood rearing.

Breeding Population Indices

Examination of the duck breeding-pair estimates by area reveal that the 1958 counts were up 8.8 percent from 1957 and 8.7 percent above the four-year average (Table 1).

Table 1. Summary of Colorado Duck Breeding Ground Conditions -
1958 with 1957 and the 4-Year Average for Comparison

| Area | Total Estimated Breeding Pairs | | |
|------------------------|--------------------------------|--------|--------|
| | 4-Year Average | 1957 | 1958 |
| San Luis Valley | 6,413 | 4,838 | 8,720 |
| North Park | 3,486 | 3,411 | 3,534 |
| South Platte Valley | 1,680 | 1,657 | 1,782 |
| Cache la Poudre Valley | 1,701 | 2,800 | 1,419 |
| Yampa Valley | 2,821 | 3,356 | 2,077 |
| Brown's Park | 122 | 208 | 199 |
| TOTALS | 16,307 | 16,260 | 17,731 |

Goose breeding conditions held fairly steady with 1956 and 1957 figures. Previously projected breeding-pair estimates are know to be high, therefore, this report will use the actual ground count figures for the years 1956, 1957 and 1958 (Table 2).

COLORADO - Continued

Table 2. Comparison of Colorado Goose Breeding Ground Surveys - 1956-1958

| Area | Total Observed Breeding Pairs | | | | | | | | |
|-------------|-------------------------------|-------|-------------|---------------|-------|-------------|---------------|-------|-------------|
| | 1956 | | | 1957 | | | 1958 | | |
| | Nesting Pairs | Young | Total Birds | Nesting Pairs | Young | Total Birds | Nesting Pairs | Young | Total Birds |
| Yampa River | 12 | 36 | 78 | 12 | 13 | 55 | 11 | 42 | 90 |
| Green River | 4 | 17 | 27 | 4 | 16 | 38 | 5 | 64 | 76 |
| TOTAL | 16 | 53 | 105 | 16 | 29 | 93 | 16 | 106 | 166 |

Species composition of the breeding duck population was quite similar to past years (Table 3). Mallards made up the bulk of the breeding birds (56.6%) and pintails (15.7%) were the only other species to exceed 10 percent of the total number of ducks. Shovelers also showed a marked increase, due probably to the abundance of shallow water areas this year.

Table 3. Species Composition of the Colorado Breeding Population 1958, 1957 and 4-Year Average

| Species | Number of Ducks | | | Species Composition Percent | | |
|--------------------|-----------------|--------|--------|-----------------------------|-------|-------|
| | 4-Year Average | 1957 | 1958 | Average | 1957 | 1958 |
| | | | | | | |
| Mallard | 10,475 | 9,944 | 10,030 | 64.3 | 61.2 | 56.6 |
| Blue-winged Teal | 926 | 1,208 | 651 | 5.6 | 7.4 | 3.7 |
| Pintail | 836 | 1,023 | 2,800 | 5.2 | 6.3 | 15.7 |
| Gadwall | 1,343 | 1,150 | 1,270 | 8.3 | 7.1 | 7.2 |
| Baldpate | 354 | 276 | 140 | 2.1 | 1.7 | 0.8 |
| Shoveler | 381 | 375 | 1,181 | 2.4 | 2.3 | 6.5 |
| Cinnamon Teal | 594 | 562 | 418 | 3.6 | 3.5 | 2.4 |
| Green-winged Teal | 429 | 682 | 260 | 2.7 | 4.2 | 1.5 |
| Redhead | 502 | 739 | 544 | 3.0 | 4.5 | 3.1 |
| Scaup | 306 | 201 | 294 | 1.7 | 1.2 | 1.7 |
| Ruddy Duck | 26 | - | 87 | 0.2 | - | 0.5 |
| Bufflehead | 3 | - | - | 0.1 | - | - |
| American Merganser | 135 | 100 | 56 | 0.8 | 0.6 | 0.3 |
| TOTALS | 16,307 | 16,260 | 17,731 | 100.0 | 100.0 | 100.0 |

Conclusions

Considering the excellent weather and water conditions, and the increased breeding population, it is believed that the fall duck flight will be average or above, probably similar to 1957.

Geese still present a fairly dismal picture, due in part to the lack of sub-adult birds resulting from poor production or over-harvest in previous years. There appears to be a definite need for continued restrictions and protection for Canada geese in northwest Colorado.

NEBRASKAWeather and Water Conditions

Conditions in the Nebraska Sandhills were generally favorable to the 1958 waterfowl breeding population. Very mild weather prevailed during the winter and most lakes were free of ice by March 1. Continued seasonable weather during the breeding season resulted in an advanced phenology at least two weeks earlier than in 1957 and perhaps as much as one week earlier than the locally accepted average.

Water conditions were fair to excellent and generally reflected the somewhat spotted precipitation which was locally average to considerably above average for 1957 and the first half of 1958. The southern portion of the eastern Sandhills (Wheeler and Garfield Counties) and the western portion of the central Sandhills (central Cherry County) had only average precipitation and had somewhat limited amounts of available breeding habitat. The remainder of the Sandhills showed spectacular recovery from the drought of 1954-56 and habitat conditions remained generally good throughout the breeding and nesting seasons. All the Sandhill lakes, the levels of which are generally controlled by the ground water table, were up from 1957 and in some cases, equaled the record levels of 1950-52.

A rather severe dry-up of the small potholes in the eastern and central Sandhills resulted from the brief hot, dry weather of early June. However, above average precipitation in late June and July restored many of these areas back and also maintained excellent water levels in all lakes and marshes.

Breeding Population IndicesBreeding Population Surveys

Table I 1958 Waterfowl Population Indexes

| | Eastern | Central | Western | Over-all |
|----------------------------------|---------|---------|---------|----------|
| Square Miles in Study Area | | | | |
| Stratum B | 734 | 1,815 | 2,814 | |
| Stratum A | 3,859 | 2,824 | 4,186 | |
| Observed Ducks per Square Mile | | | | |
| Stratum B | 3.70 | 0.32 | 3.80 | |
| Stratum A | 5.66 | 11.80 | 25.00 | |
| Aerial Survey Index* | 24,558 | 33,904 | 115,343 | 173,805 |
| Percent Non-breeders Observed | 8.9 | 6.1 | 29.9 | |
| Breeding Duck Index | 22,384 | 31,854 | 80,918 | |
| Percent Lone Males Observed | 39.2 | 34.1 | 17.3 | |
| Hen-on-nest Correction | 9,613 | 11,565 | 20,042 | |
| Corrected Breeding Ducks Indexes | 31,997 | 43,419 | 100,960 | 176,376 |

* Duck per square mile x square miles in study area.

NEBRASKA - Continued

Table II. 1958 Waterfowl Population Trends

| | | |
|---|---------|------------------------|
| 1958 Aerial Index | 173,805 | |
| 1957 Aerial Index | 124,165 | change to 1958 / 40.0% |
| Average of 1954-57 aerial indexes | 123,534 | change to 1958 / 40.7% |
| 1958 Breeding Duck Index* | 176,376 | |
| 1957 Breeding Duck Index | 154,800 | change to 1958 / 13.9% |
| Average of 1954-57 Breeding Duck Indexes. . | 128,142 | change to 1958 / 37.6% |

* Corrected for non-breeding or loafing ducks and hens on nests which could not be seen during the aerial surveys.

These surveys indicated the 1958 breeding duck population in the Sandhills to have increased from that of the 1957 season and to have increased significantly from the average breeding population during the four prior years. As in past years, observations indicated this increase to have been directly correlated to the increased habitat available at the beginning of the season.

It can be noted from Table III that increases were general for all species except the blue-winged teal which species had been attracted in large numbers by the late-appearing habitat available in 1957.

Table III. 1958 Waterfowl Breeding Population Species Composition and Trends

| | Corrected Species Indexes* | | | | Percent of 1958 | 1957 | Percent Change |
|------------|----------------------------|---------|---------|----------|--------------------|---------|-------------------|
| | Eastern | Central | Western | Over-all | Population | Index | 1957-58 |
| Mallard | 3,269 | 7,079 | 17,719 | 28,067 | 15.9 | 26,799 | / 4.7 |
| Gadwall | 952 | 1,065 | 8,068 | 10,085 | 5.7 | 5,664 | / 78.1 |
| Baldpate | 405 | 271 | 1,230 | 1,906 | 1.1 | 1,281 | / 48.8 |
| Pintail | 3,566 | 8,756 | 20,347 | 32,669 | 18.5 | 18,575 | / 75.9 |
| G-W Teal | | 136 | 615 | 751 | 0.4 | 176 | / 326.7 |
| B-W Teal | 20,743 | 21,638 | 28,920 | 71,301 | 40.4 | 78,659 | - 9.4 |
| Shoveler | 2,790 | 3,730 | 13,737 | 20,247 | 11.5 | 13,703 | / 47.8 |
| Redhead | 135 | 378 | 5,973 | 6,486 | 3.7 | 5,133 | / 26.4 |
| Canvasback | | | | | | 2,931 | |
| Scaup | | 126 | 1,200 | 1,326 | 0.8 | 889 | / 49.2 |
| Ruddy | | 240 | 3,151 | 3,391 | 1.9 | 990 | / 242.5 |
| Ringneck | 147 | | | 147 | 0.1 | | |
| TOTAL | 31,997 | 43,419 | 100,960 | 176,376 | 100.0 | 154,800 | / 13.9 |

* Adjusted for hens-on-nest and non-breeders.

NEBRASKA - Continued

Production Indices

All indications were that the 1958 waterfowl production success was at least average. The first broods were reported and observed somewhat earlier than the average of the ten preceding years; however, the peak brood occurrence was very nearly average. Brood surveys made during the period July 7 -- 11 showed that of 63 broods of all species observed, 56% were of age class I, 38% of age class II and 6% of age class III. As the observed broods were predominately blue-winged teal, these data indicate hatching peaks comparable to the average.

Aerial brood counts were again made over two select breeding population routes in each area. These counts which were designed to provide an estimate of the production success of the breeding population, indicate one brood per 18.8 ducks observed on the breeding population surveys in the eastern Sandhills, one brood per 7.7 ducks in the central Sandhills and one brood per 16.1 ducks in the western Sandhills. The survey conditions encountered were so different from those of the preceding surveys that comparison of the results is impossible.

An average of 6.8 ducklings was observed in the broods of all age classes and all species.

Conclusions

From the data available, it may be assumed that the number of ducks entering the Flyway from Nebraska in 1958 will show some increase over 1957 and a substantial increase over the average of the 1954-57 fall flights.

Mississippi Flyway Data

Waterfowl Kill Information

The following table presents the estimated number of waterfowl bagged and waterfowl knocked down but not retrieved during the 1956-57 and 1957-58 shooting seasons as determined by the Waterfowl Hunter Mail Survey:

| Species | 1957-1958 | 1956-1957 | Percent Change 1956-1957 to 1957-1958 |
|---------------------------|-----------|-----------|---|
| Mallard | 2,587,149 | 2,775,452 | - 6.78 |
| G-W Teal | 289,073 | 438,706 | - 34.11 |
| B-W Teal | 276,559 | 407,538 | - 32.14 |
| Pintail | 199,943 | 242,933 | - 17.70 |
| Black Duck | 177,943 | 218,510 | - 18.57 |
| Scaup | 283,652 | 211,140 | / 24.34 |
| Canvasback | 183,183 | 167,399 | / 9.43 |
| Redhead | 140,538 | 75,871 | / 85.23 |
| Ring-necked | 107,561 | 52,508 | / 104.85 |
| Gadwall | 11,430 | 44,270 | - 74.18 |
| Am. Wigeon | 55,701 | 41,428 | / 34.45 |
| Ruddy | 19,290 | 36,659 | - 47.38 |
| Shoveler | 27,285 | 31,023 | - 12.05 |
| Merganser | 22,587 | 29,722 | - 24.01 |
| Goldeneye | 44,135 | 18,546 | / 137.98 |
| Bufflehead | 26,608 | 18,402 | / 44.59 |
| Scoter | 1,987 | 3,757 | - 47.11 |
| Wood Duck | 60,760*** | 3,035 | / 1901.98* |
| Others | 2,078 | 339 | / 512.98 |
| <hr/> | | | |
| Total Ducks Retrieved | 4,517,462 | 4,817,238 | - 6.22 |
| Total Ducks not retrieved | 1,110,958 | 1,107,297 | N.C. |
| Total Duck Kill | 5,628,420 | 5,924,535 | - 5.00 |
| <hr/> | | | |
| Canada Goose** | 163,244 | 178,540 | - 8.57 |
| Blue Goose | 50,798 | 46,563 | / 9.10 |
| Snow Goose | 31,922 | 32,997 | N.C. |
| White-fronted Goose | 15,477 | 8,007 | / 93.29 |
| <hr/> | | | |
| Total Geese Retrieved | 261,441 | 266,107 | N.C. |
| Total Geese not retrieved | 55,658 | 37,328 | / 49.11 |
| Total Goose Kill | 317,099 | 303,435 | / 4.50 |
| <hr/> | | | |
| Total Coot Retrieved | 258,768 | 377,315 | - 31.42 |
| Total Coot not retrieved | 64,018 | 98,371 | - 34.92 |
| Total Coot Kill | 322,786 | 475,686 | - 32.14 |

* No open season on Wood Duck during 1956-57.

** All white-cheeked geese included as Canada geese.

*** Closed season on Wood Ducks in the States of Kentucky, Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri and Wisconsin.

Mississippi Flyway Data

MISSISSIPPI FLYWAY

Number of Hunters, Average Times Hunted, Seasonal Bag, Seasonal Unretrieved Kill and Daily Bag as Determined by the Waterfowl Hunter Mail Survey.

| | | 1957-1958 | 1956-1957 | Percent Change 1956-1957 to 1957-1958 |
|---|-------|-----------|-----------|---|
| Number of Potential Hunters | | | | |
| Over 15* | | 1,004,255 | 1,016,338 | N.C. |
| Under 16 | | 75,300 | 94,193 | - 20.06 |
| | | 1,079,555 | 1,110,531 | N.C. |
| Number of Active Hunters** | | | | |
| Over 15 | | 870,192 | 870,605 | N.C. |
| Under 16 | | 58,180 | 69,864 | - 16.72 |
| | | 928,372 | 940,469 | N.C. |
| Average Times Hunted** | | 4.289 | 4.382 | N.C. |
| Average Seasonal Bag** | | | | |
| <u>Over 15</u> | Ducks | 5.184 | 5.309 | N.C. |
| | Geese | .302 | .296 | N.C. |
| | Coot | .296 | .396 | - 25.25 |
| <u>Under 16</u> | Ducks | 2.376 | 2.795 | - 14.99 |
| | Geese | .112 | .123 | - 8.94 |
| | Coot | .142 | .471 | - 69.85 |
| Average Seasonal No. not retrieved** | | | | |
| <u>Over 15</u> | Ducks | 1.222 | 1.209 | N.C. |
| | Geese | .061 | .040 | + 52.50 |
| | Coot | .068 | .108 | - 37.04 |
| <u>Under 16</u> | Ducks | .801 | .782 | N.C. |
| | Geese | .043 | .030 | + 43.33 |
| | Coot | .083 | .061 | + 36.07 |
| Average Daily Bag** | | | | |
| <u>Over 15</u> | Ducks | 1.209 | 1.211 | N.C. |
| | Geese | .070 | .068 | N.C. |
| | Coot | .069 | .090 | - 23.33 |
| <u>Under 16</u> | Ducks | .554 | .638 | - 13.16 |
| | Geese | .026 | .028 | N.C. |
| | Coot | .033 | .107 | - 69.15 |

* Individuals who purchased a Duck Stamp with intent to hunt.

** Individuals who hunted at least once.

Winter Trend Data - Mississippi Flyway

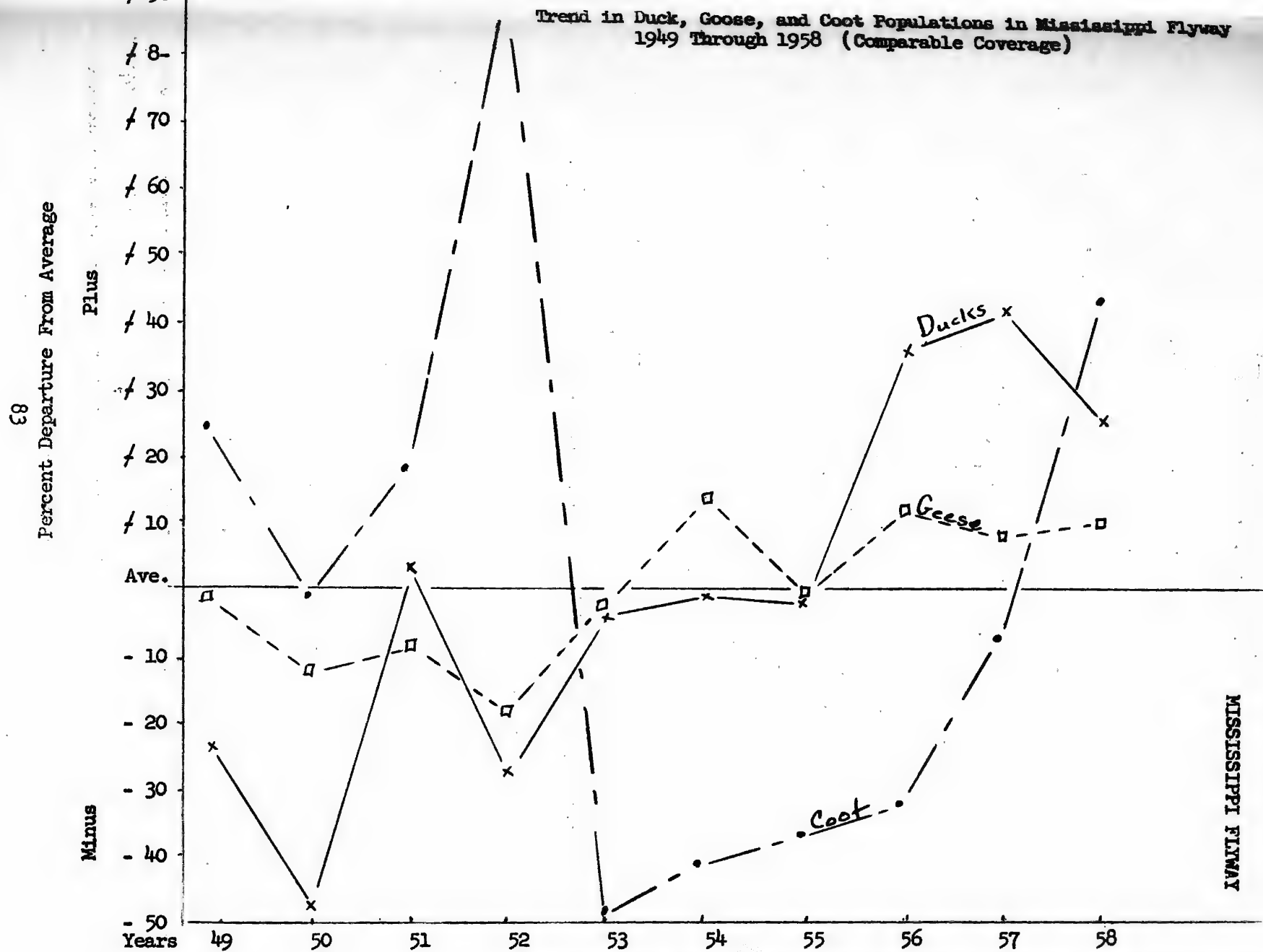
On the basis of comparable coverage between 1957 and 1958 in the Mississippi Flyway there was a 12 percent decrease in ducks, a 2 percent increase in geese, and a 58 percent increase in coot. Total waterfowl decreased 9 percent.

Species composition and percent change between 1957 and 1958 for individual species are presented in the following table. In the Graph which follows the table are presented trend data for ducks, geese and coot for the period 1949 through 1958.

Species Composition - Mississippi Flyway - 1957 and 1958 (Comparable Coverage)

| Species | Percent of Birds Identified | | Percent Change |
|---------------------|-----------------------------|-------|----------------|
| | 1957 | 1958 | |
| Mallard | 62.6 | 51.7 | - 24.8 |
| Pintail | 6.7 | 7.1 | - 3.2 |
| Blue Goose | 4.4 | 4.9 | / 1.3 |
| Green-winged Teal | 4.3 | 4.1 | - 13.3 |
| Canada Goose | 3.9 | 4.2 | - 12.5 |
| Scaup | 3.3 | 3.1 | - 14.1 |
| Black Duck | 2.8 | 3.5 | / 14.0 |
| Gadwall | 2.5 | 4.4 | / 62.8 |
| Coot | 2.2 | 3.8 | / 57.5 |
| Canvasback | 1.6 | 1.3 | - 25.8 |
| Ringneck | 1.1 | .8 | - 31.8 |
| Baldpate | .9 | 3.8 | / 306.7 |
| Ruddy | .8 | .3 | - 64.7 |
| Shoveler | .7 | 1.9 | / 143.5 |
| Goldeneye | .5 | .5 | N.C. |
| Merganser | .4 | .7 | / 51.1 |
| Snow Goose | .4 | .5 | / 21.0 |
| Redhead | .4 | .4 | - 4.9 |
| Wood Duck | .3 | .5 | / 40.7 |
| Old Squaw | .1 | .2 | / 43.6 |
| Blue-winged Teal | .1 | 2.0 | -- |
| White-fronted Goose | Tr. | .2 | -- |
| Bufflehead | Tr. | .1 | -- |
| Scoter & Eider | Tr. | Tr. | -- |
| Whistling Swan | Tr. | Tr. | -- |
| TOTAL | 100.0 | 100.0 | - 9.2 |

Trend in Duck, Goose, and Coot Populations in Mississippi Flyway
1949 Through 1958 (Comparable Coverage)



Breeding Ground Survey Data

NORTHERN SASKATCHEWAN, NORTHERN MANITOBA, AND ONTARIO

Weather and Water Conditions

Phenological development in the survey area was 10 days to two weeks earlier than "normal" and the season was considered advanced about two weeks over last year.

A comparatively mild, open winter with reduced precipitation resulted in little runoff and progressively declining water levels. Low humidity and high winds were prevalent during May which contributed to the presence of widespread fires.

Breeding Population Indices

It is usual during the breeding population survey in this area to record the bulk of the duck population (except scaup) as either pairs or single drakes. However, during the 1958 survey a surprising portion of the total were observed as groups of mixed sexes. This was particularly true of mallards and pintails. It is unlikely that these grouped birds were attempting to breed.

Aerial Coverage - May 1958

| Province | Strata Description | Area Square Miles | No. 18-Mile Segments | Lineal Miles | Sq. Miles Surveyed |
|------------------------------------|-----------------------|-------------------|----------------------|--------------|--------------------|
| Ontario | Closed Forest (C) | 195,572 | 75 | 1,350 | 337.5 |
| Manitoba | Closed Forest (C) | 67,360 | 55 | 1,090 | 247.5 |
| Manitoba | Sask. River Delta (D) | 3,960 | 12 | 216 | 54.0 |
| Saskatchewan (South of 55° 30') | Closed Forest (C) | 50,990 | 63 | 1,134 | 283.7 |
| Saskatchewan (North of 55° 30') | Closed Forest (C) | 111,070 | 33 | 604 | 151.0 |
| TOTAL | | 418,952 | 238 | 4,394 | 1,073.7 |

Breeding Population Indices by Strata (1958) and Comparison with 1957 Totals

| Species | STRATA | | | | | 1958 Total | 1957 Total | Percent Change |
|-------------------|---------|---------|---------|------------------|------------------|---------------|---------------|-------------------|
| | Ontario | Man. D. | Man. C. | Sask. C South | Sask. C North | | | |
| Mallard | 47,200 | 37,100 | 60,000 | 86,100 | 33,450 | 263,850 | 260,128 | / 1 |
| Scaup | 69,400 | 25,550 | 71,650 | 40,700 | 61,800 | 269,100 | 445,727 | - 40 |
| Merganser | 122,150 | - | 20,000 | 6,300 | 69,500 | 217,950 | 132,906 | / 64 |
| Canvasback | 16,650 | 4,950 | - | - | - | 21,600 | 2,086 | / 935 |
| Goldeneye | 11,100 | 800 | 6,650 | 9,400 | 41,200 | 69,150 | 8,675 | / 697 |
| Bufflehead | 5,550 | - | 3,350 | 3,150 | 7,700 | 19,750 | 5,033 | / 292 |
| Black Duck | 5,550 | - | - | - | - | 5,550 | - | - |
| Baldpate | - | 4,100 | 1,650 | - | 2,550 | 8,300 | 6,500 | / 28 |
| Pintail | - | 4,950 | - | 1,550 | - | 6,500 | 12,188 | - 47 |
| B-W Teal | - | 4,950 | 1,650 | 6,300 | 5,150 | 18,050 | 1,172 | / 1440 |
| Scoter | - | - | - | - | 36,050 | 36,050 | 53,382 | - 14 |
| G-W Teal | - | - | - | - | - | - | 6,364 | - 100 |
| Gadwall | - | - | - | - | - | - | 3,467 | - 100 |
| Shoveler | - | - | - | - | - | - | 1,130 | - 100 |
| Redhead | - | - | - | - | - | - | 6,215 | - 100 |
| Ringneck | - | - | - | - | - | - | 1,156 | - 100 |
| 1958 TOTAL | 277,600 | 82,400 | 164,950 | 153,500 | 257,400 | 935,850 | - | - |
| 1957 TOTAL | 176,350 | 86,932 | 192,612 | 159,092 | 331,143 | - | 946,129 | - 1 |
| Percent Change | / 57 | - 5 | - 14 | - 4 | - 22 | - | - | - 1 |

Total Duck Indices by Provinces - 1955--1958

| Province | INDEX | | | | Average | Percent | Change |
|--------------|------------------|----------------|----------------|----------------|----------------|--------------|--------------|
| | 1955 | 1956 | 1957 | 1958 | | From 1957 | From Ave. |
| Ontario * | 230,159 | 111,677 | 176,350 | 277,600 | 198,946 | / 57 | / 40 |
| N. Manitoba | 380,429 | 197,291 | 279,544 | 247,350 | 276,154 | - 12 | - 10 |
| N. Sask. | 658,649 | 262,585 | 490,235 | 410,900 | 455,592 | - 16 | - 10 |
| TOTAL | 1,269,237 | 571,553 | 946,129 | 935,850 | 930,692 | - 1 | / 1 |

Conclusions

In view of the "grouped bird" observations made this year which is interpreted to be indicative of lack of breeding success, and the water deficient habitat conditions, a below average duck crop is expected from this area.

SOUTHERN MANITOBAWeather and Water Conditions

The spring of 1958 was one of the warmest and driest since the surveys were initiated. Fall rains were generally light and the breakup which began in late March and continued until a blizzard in late April contributed little runoff. Little moisture was added by this blizzard and no rains of any consequence occurred during the survey period. Several severe dust storms were encountered during the survey. In spite of the lack of recent precipitation and runoff, water levels in southern Manitoba were generally above normal. Sufficient surface water remained from previous years to maintain high levels in the larger water areas, and many areas which previous to 1955 were "temporaries" now have the characteristics of semi-permanent ponds. While very shallow temporary water is absent, there is no shortage of water in the parklands and prairies of Manitoba. The table below shows the number of water areas counted on the aerial surveys during the past eight years. The increase in the number of water areas in stratum "A" this year is probably a matter of interpretation on the part of the different crews involved.

Water Area Index - Southern Manitoba - May Aerial Survey

| Year | Ponds in Stratum "A" | Ponds in Stratum "B" | Ponds in Strata "A" & "B" |
|--------------------|-------------------------|-------------------------|------------------------------|
| 1951 | 240,500 | 185,900 | 426,400 |
| 1952 | 174,200 | 155,400 | 329,600 |
| 1953 | 186,600 | 311,700 | 498,300 |
| 1954 | 258,200 | 1,075,400 | 1,333,600 |
| 1955 | 314,700 | 427,700 | 742,400 |
| 1956 | 390,700 | 614,800 | 1,005,500 |
| 1957 | 262,200 | 404,000 | 666,200 |
| 1958 | 351,500 | 264,400 | 615,900 |
| Average 1951-57 | 272,300 | 429,900 | 702,200 |

The drought conditions of the fall, winter and spring continued until July 3, 4 and 5 when considerable rain fell in southern Manitoba. While some of this occurred as a general downpour in the Red River Valley and Portage Plains of the unimportant eastern portion of Stratum "B," most of the good duck production habitat received rather steady gentle rain, ideal for the farmer, but producing little runoff into the potholes. This

is illustrated by the July pond index indicating that the number of water areas in Stratum "B," increased over last year, while those in Stratum "A" decreased. Throughout the area, there will be sufficient water for broods, some portions still experiencing above normal levels.

Water Index - Southern Manitoba - July Aerial Survey

| Years | Ponds in Stratum "A" | Ponds in Stratum "B" | Total |
|---------|-------------------------|-------------------------|---------|
| 1954 | 472,400 | 384,200 | 856,600 |
| 1955 | 339,300 | 270,900 | 610,200 |
| 1956 | 425,900 | 411,600 | 837,500 |
| 1957 | 241,700 | 259,700 | 501,400 |
| 1958 | 163,300 | 341,000 | 504,300 |
| Average | 328,500 | 333,500 | 662,000 |

Breeding Population Indices

Some individuals of most species arrived early in 1958; all but the gadwall being present at the Delta Waterfowl Research Station by April 10. However, there was a considerable later movement of birds into the Province, presumably from the drier prairies to the south and west. Some of these birds remained as groups of pairs throughout the survey period. Since they were not seen as pairs or singles, their potential productivity is unknown and probably low. However, there is no question but what they will make up a portion of the fall flight. Hence, they are included as a separate population index of "flocked ducks," neither migrants nor actually nesting at the time they were seen. While it is usual in Manitoba to find from 50,000 to 75,000 scaup in this condition, such groups normally occur among other species in negligible numbers. However, such groups amounted to nearly 300,000 birds in 1958. On the other hand, the bulk of the population, amounting to nearly a million birds, occurred as drakes and separate pairs, indicating they were nesting or about to nest. There was an increase in most species over 1957 populations. The mallard, pintail and shovler were the only species prominent in the records which did not increase in 1958.

May Waterfowl Populations - Southern Manitoba - 1957 - 1958

| Species | 1957 Strata "A" & "B" | Stratum "A" | | Stratum "B" | | Strata "A" & "B" | | Species Composi- tion 1958 | Percent Change** |
|------------|-----------------------------|-----------------|-------------------|-----------------|------------------|------------------|------------------|----------------------------------|---------------------|
| | | Drakes Pairs | Flocked* Ducks | Drakes Pairs | Flocked Ducks | Drakes Pairs | Flocked Ducks | | |
| Pintail | 99,300 | 47,000 | 2,500 | 26,100 | - | 73,100 | 2,500 | 7.6% | - 26.4% |
| Mallard | 500,000 | 281,600 | 10,900 | 208,900 | 10,200 | 490,500 | 21,100 | 51.3% | - 1.9% |
| Baldpate | 24,700 | 33,500 | 17,700 | 19,500 | 20,200 | 53,000 | 37,900 | 5.5% | / 114.6% |
| Shoveler | 38,300 | 20,500 | - | 7,700 | - | 28,200 | - | 2.9% | - 35.7% |
| Gadwall | 5,500 | 4,600 | - | 3,100 | - | 7,700 | - | .8% | / 40.0 |
| B-W Teal | 62,700 | 80,400 | 12,700 | 44,500 | 3,300 | 124,900 | 16,000 | 13.1% | / 99.2% |
| G-W Teal | 3,400 | 6,200 | - | 1,000 | - | 7,200 | - | .8% | / 111.8% |
| Scaup | 60,200 | 35,700 | 93,500 | 34,800 | 110,300 | 70,500 | 203,800 | 7.4% | / 17.1% |
| Canvasback | 31,400 | 32,500 | 4,400 | 24,100 | - | 56,600 | 4,400 | 5.9% | / 80.3% |
| Redhead | 16,900 | 10,700 | 200 | 15,900 | 5,100 | 26,600 | 5,300 | 2.8% | / 57.4% |
| Ringneck | 3,800 | 2,500 | 1,300 | 3,100 | - | 5,600 | 1,300 | .6% | / 47.4% |
| Ruddy | 7,000 | 4,700 | 1,800 | 1,500 | - | 6,200 | 1,800 | .6% | - 11.4% |
| Goldeneye | 5,400 | 200 | 100 | 2,100 | 4,600 | 2,300 | 4,700 | .2% | - 57.4% |
| Bufflehead | 400 | 800 | - | 2,600 | - | 3,400 | - | .4% | / 750.0% |
| Scoter | 1,300 | 700 | - | - | - | 700 | - | .1% | - 46.2% |
| Wood Duck | - | 200 | - | - | - | 200 | - | Tr. | - |
| <hr/> | | | | | | | | | |
| TOTAL | 860,300 | 561,900 | 145,000 | 394,900 | 153,800 | 956,800 | 298,800 | 100.0% | / 11.2% |

* Flocked ducks are those seen in broups of both sexes.

** Refers only to birds seen as drakes and pairs.

May Coot Populations - Southern Manitoba

| Year | Stratum "A" | Stratum "B" | Strata "A" & "B" |
|------|-------------|-------------|------------------|
| 1954 | 6,900 | 2,000 | 8,900 |
| 1955 | 16,200 | 12,300 | 28,500 |
| 1956 | 27,600 | 12,400 | 40,000 |
| 1957 | 15,400 | 5,400 | 20,800 |
| 1958 | 52,500 | 28,400 | 80,900 |

May Waterfowl Population Indices, Southern Manitoba Aerial Survey

| | Stratum "A" (10,368 sq. mi.) | | Stratum "B" (28,600 sq. mi.) | | Strata "A" & "B" (38,968 sq. mi.) | |
|-----------|---------------------------------|------------------|---------------------------------|------------------|--------------------------------------|------------------|
| | Pairs & Drakes | Flocked Ducks | Pairs & Drakes | Flocked Ducks | Pairs & Drakes | Flocked Ducks |
| 1951 | 472,800 | | 165,900* | | 638,700* | |
| 1952 | 343,200 | | 177,300 | | 520,500 | |
| 1953 | 209,400 | | 151,600 | | 361,000 | |
| 1954 | 317,100 | | 228,300 | | 545,400 | |
| 1955 | 345,100 | | 424,200 | | 769,300 | |
| 1956 | 417,200 | | 499,600 | | 916,800 | |
| 1957 | 420,300 | | 440,000 | | 860,300 | |
| 1958 | 561,900 | 145,000** | 394,900 | 153,800** | 956,800 | 298,800** |
| Average | | | | | | |
| 1951-1958 | 385,900 | | 310,200 | | 696,100 | |

* Stratum "B" data not corrected for absent hens in 1951.

** Flocks of drakes and hens of species normally breeding in the area and not assumed to be migrants.

Percent Lone Males of Pintail, Mallard and Canvasback - 1956-1958

| Year | Stratum "A" | Stratum "B" | Strata "A" & "B" |
|------|-------------|-------------|------------------|
| 1956 | 73.7% | 83.6% | 79.4% |
| 1957 | 86.5% | 91.5% | 89.2% |
| 1958 | 80.0% | 84.6% | 81.9% |

SOUTHERN MANITOBA - ContinuedProduction Indices

There is practically no change in the brood index between 1957 and 1958. On the other hand, the late nexting index (those birds seen as singles or pairs), used as an indication of continued nesting effort, increased 214% indicating that considerable nesting was still taking place during the period of the survey. The age class distribution of the broods also bears this out. The percentabe of broods in age class 1 for both strata was the second highest for the years 1954 to 1958, averaging 51.5%. This indicates that the survey was conducted in the early part of the brood season for the bulk of the population and that there are probably more broods to come.

There is no significant decreases in the late nexting index for any species. While this is probably a valid indicator of continued nesting effort for most species, it is probable that the nesting season of the canvasback was for all practical purposes over at the time of the survey.

Due to the very conspicuous tendency this year for birds to moult on the potholes rather than in the larger marshes, there may be pre-moulting or moulting birds included in the index, even though every effort was made to record only singles and pairs.

Coot broods showed a slight decrease from 1957, but the index is still well above the average.

A table is included showing the trends since 1954. The duck brood index and late nesting index are the highest for the five-year period in both strata, while coot indices were exceeded only in 1957.

Counts were made on 90 age class II and III broods that were judged to be complete. The number of ducklings per brood is considerably higher than that of previous years.

Comparison of July Brood and Late Nesting Indices
Southern Manitoba - 1957 and 1958

| Species | Stratum "A" | | Stratum "B" | | Strata "A" & "B" | | Percent Change 1957-58 |
|-----------------------------|-------------|---------|-------------|---------|------------------|---------|------------------------------|
| | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | |
| <u>Duck Brood Index</u> | | | | | | | |
| All Species | 37,700 | 39,400 | 22,700 | 23,400 | 60,400 | 62,800 | / 4 |
| <u>Late Nesting Indices</u> | | | | | | | |
| Pintail | 200 | 2,600 | 2,800 | 2,100 | 3,000 | 4,700 | |
| Mallard | 10,200 | 14,500 | 3,700 | 9,300 | 13,900 | 23,800 | |
| Baldpate | 200 | 6,500 | - | 2,100 | 200 | 8,600 | |
| Shoveler | 300 | 800 | - | - | 300 | 800 | |
| Gadwall | 900 | 700 | - | - | 900 | 700 | |
| B-W Teal | 3,100 | 12,200 | - | 3,600 | 3,100 | 15,800 | |
| G-W Teal | 100 | 500 | - | - | 100 | 500 | |
| Scaup | 700 | 8,600 | - | 2,600 | 700 | 11,200 | |
| Canvasback | - | 1,700 | - | 2,600 | - | 4,300 | |
| Redhead | 200 | 2,600 | - | 500 | 200 | 3,100 | |
| Ringneck | 100 | 1,600 | - | - | 100 | 1,600 | |
| Ruddy | 1,200 | 2,400 | 1,800 | 3,100 | 3,000 | 5,500 | |
| Goldeneye | 700 | 400 | - | - | 700 | 400 | |
| Bufflehead | - | 300 | - | 500 | - | 800 | |
| Black Duck | - | - | - | 500 | - | 500 | |
| Scoter | - | 100 | - | - | - | 100 | |
| <hr/> | | | | | | | |
| TOTAL | 17,900 | 55,500 | 8,300 | 26,900 | 26,200 | 82,400 | / 214 |
| <hr/> | | | | | | | |
| Coot Broods | 9,700 | 7,400 | 6,500 | 5,800 | 16,200 | 13,200 | - 19 |
| <hr/> | | | | | | | |
| Ponds | 241,700 | 163,300 | 259,700 | 341,000 | 501,400 | 504,300 | / 1 |
| <hr/> | | | | | | | |

Age Class Distribution of Broods - 1954 to 1958

| Year | Stratum "A" | | | Stratum "B" | | | Strata "A" and "B" | | |
|------|-----------------|------------------|-------------------|-----------------|------------------|-------------------|--------------------|------------------|-------------------|
| | % in Class I | % in Class II | % in Class III | % in Class I | % in Class II | % in Class III | % in Class I | % in Class II | % in Class III |
| 1954 | 61.5 | 33.5 | 5.0 | 62.9 | 20.0 | 17.1 | 62.2 | 26.4 | 11.4 |
| 1955 | 41.9 | 30.2 | 27.9 | 17.4 | 43.5 | 39.1 | 29.9 | 36.7 | 33.4 |
| 1956 | 31.2 | 41.6 | 27.2 | 17.6 | 50.0 | 32.4 | 29.4 | 42.8 | 27.8 |
| 1957 | 29.2 | 43.2 | 27.6 | 28.1 | 56.1 | 15.8 | 29.1 | 44.4 | 26.5 |
| 1958 | 51.7 | 34.5 | 13.8 | 45.2 | 45.2 | 9.7 | 51.2 | 35.4 | 13.5 |

Average Size of Class II and III Broods - Southern Manitoba
1954 to 1958

| <u>Year</u> | <u>Number Broods Counted</u> | <u>Young Per Class II & III Broods</u> |
|-------------|--------------------------------------|--|
| 1954 | 26 | 5.7 |
| 1955 | 28 | 5.6 |
| 1956 | no data | 5.1 |
| 1957 | no data | 5.6 |
| 1958 | 90 | 6.6 |

Conclusions

There will be a considerable increase in the fall flight from Southern Manitoba as compared to 1957.

MINNESOTAWeather and Water Conditions

During May, dry conditions were very evident in the southwest sections of Minnesota.

Moderate to heavy rains occurred in late May and June in both the Northwest and Southwest strata. In the central sections of Minnesota, water was available although levels were low in many lakes. However, steep banks, great depth, lack of vegetation and timber do not lend themselves to good areas for reproduction for some species of waterfowl.

Breeding Population Indices1958 Breeding Population Indices by Strata

| Species | STRATA | | | | | |
|----------|-----------|----|-----------|-----|--------|-----|
| | Northwest | | Southwest | | Total | |
| | Number | % | Number | % | Number | % |
| Pintail | 1,531 | 11 | 7,928 | 18 | 9,459 | 16 |
| Mallard | 6,115 | 44 | 23,787 | 53 | 29,902 | 51 |
| Shoveler | - | - | 720 | 2 | 720 | 1 |
| B-W Teal | 6,115 | 44 | 9,371 | 21 | 15,486 | 27 |
| Ruddy | - | - | 2,882 | 6 | 2,882 | 5 |
| TOTAL | 13,761 | 99 | 44,688 | 100 | 58,449 | 100 |

Comparison of the 1958 Aerial Survey Data With That of 1957

| Stratum | Population | | | | Pond Index | |
|-----------|------------|--------|------------|-------|------------|--------|
| | Duck Index | | Coot Index | | 1957 | 1958 |
| | 1957 | 1958 | 1957 | 1958 | | |
| Northwest | 22,435 | 13,761 | - | 505 | - | 5,229 |
| Southwest | 23,122 | 44,689 | - | 2,075 | - | 11,086 |
| TOTALS | 46,122 | 58,450 | - | 2,580 | - | 16,315 |

Percent of change of the 1958 index from that of 1957 / 12.6

Production Indices

Production surveys were made by an aerial crew which covered the same transects that were flown in May. A survey was made also on the Chippewa National Forest Study area. A production survey has been carried out on this study area each year since 1937. The data collected during both surveys are as follows:

Minnesota Mid-July Aerial Survey - 1958

| | Northwest | Southwest | State Total |
|---------------------------|-----------|-----------|-------------|
| Size in Square Miles | 12,386 | 24,910 | 37,296 |
| Sample Size in Square Mi. | 13.5 | 51 | 64.5 |
| Broods Actually Seen | 5 | 16 | |
| Broods/Square miles | 0.37 | 0.31 | 0.33 |
| Brood Index | 4,583 | 7,722 | 12,305 |
| Sample Late Nesting Index | 5 | 9 | |
| Late Nesting/Square Mile | 0.37 | 0.18 | |
| Late Nesting Index | 4,583 | 4,484 | 9,067 |
| Ponds Actually Seen | 120 | 416 | |
| Ponds/Square Mile | 8.9 | 8.2 | |
| Pond Index | 110,235 | 204,262 | 314,497 |
| Coot Broods Seen | 2 | 6 | |
| Coot Brood/Square Mile | 0.15 | 0.12 | |
| Coot Brood Index | 1,858 | 2,989 | 4,847 |

Late Nesting Index

| Species | Northwest | Southwest | Total | % Comp. |
|--------------|-----------|-----------|-------|---------|
| Mallard | - | 2,242 | 2,242 | 24.7 |
| Baldpate | - | 2,242 | 2,242 | 24.7 |
| Unidentified | 4,583 | | 4,583 | 50.6 |
| TOTALS | 4,583 | 4,484 | 9,067 | 100.0 |

MINNESOTA - Continued

| Brood Size Class | OBSERVED IN SAMPLE | | INDEX | | Ave. Size |
|---------------------|--------------------|-------------|----------|-------------|--------------|
| | # Broods | # Ducklings | # Broods | # Ducklings | |
| II | 13 | 69 | 7,636 | 40,471 | 5.3 |
| III | 5 | 28 | 3,300 | 18,480 | 5.6 |

Comparison of 1957-1958 Mid-July Aerial Survey in Minnesota

| | 1957 | 1958 | % Change |
|----------------------|---------|---------|----------|
| Broods Actually Seen | 22 | 21 | |
| Broods/Square Mile | 0.35 | 0.33 | |
| Brood Index | 12,566 | 12,305 | - 2.1 |
| Late Nesting Index | 14,030 | 9,067 | - 35.4 |
| Pond Index | 339,892 | 314,497 | - 7.5 |
| Coot Brood Index | 4,148 | 4,847 | + 16.8 |
| Average Brood Size | | | |
| Class II | 6.6 | 5.3 | - 19.7 |
| Class III | 5.3 | 5.6 | + 5.7 |

Number of Adults and Juveniles Seen During 1957-1958
Chippewa National Forest

| Species | Adults | Juveniles | Ratio | Adults | Juveniles | Ratio |
|-----------|--------|-----------|-------|--------|-----------|-------|
| Mallard | 145 | 267 | 1:1.8 | 415 | 714 | 1:1.7 |
| Baldpate | 149 | 170 | 1:1.1 | 122 | 246 | 1:2.1 |
| Goldeneye | 62 | 245 | 1:3.9 | 45 | 172 | 1:3.8 |
| B-W Teal | 14 | 5 | 1:0.4 | 35 | 131 | 1:3.7 |
| Ringneck | 16 | 0 | 1:0.0 | 7 | 6 | 1:0.8 |
| Wood Duck | 5 | 0 | 1:0.0 | 26 | 48 | 1:1.9 |
| Other | 6 | 30 | 1:5.0 | 29 | 0 | 1:0.0 |
| <hr/> | | | | | | |
| TOTAL | 397 | 717 | 1:1.8 | 679 | 1,317 | 1:1.9 |

Total Birds Observed and Ratio of Adults to Juveniles
1952 through 1958 - Chippewa National Forest

| Year | Total Ducks | Adult/Juvenile Ratio |
|------|-------------|----------------------|
| 1952 | 2,192 | 1:3.4 |
| 1953 | 926 | 1:1.6 |
| 1954 | 1,452 | 1:2.9 |
| 1955 | 1,361 | 1:2.8 |
| 1956 | 1,985 | 1:1.6 |
| 1957 | 1,114 | 1:1.8 |
| 1958 | 2,033 | 1:1.9 |

Conclusions

It is anticipated that the fall flight from Minnesota will be about the same as 1957 with some possibility of a small increase.

MICHIGANWeather and Water Conditions

Precipitation was far below normal. The first three months of the year were the driest in Michigan's records. April and May remained dry, but June was normal.

Temperatures were slightly above normal in April, close to normal in May and below normal in June. Agricultural crops were definitely retarded because of the dry conditions and numerous late frosts.

Many ponds and swales were dry, but there is some question whether this situation seriously affected duck production because of the numerous bodies of permanent water in Michigan.

Breeding Population Indices

The potential breeding population compared to the previous years were as follows:

| <u>Year</u> | <u>Lineal Miles Censused</u> | <u>Potential Breeders Per Lineal Mile</u> |
|-------------|----------------------------------|---|
| 1949 | 85 | 6.80 |
| 1950 | 81 | 7.91 |
| 1951 | 120 | 8.18 |
| 1952 | 82 | 7.13 |
| 1953 | 95.5 | 12.75 |
| 1954 | 93.5 | 12.31 |
| 1955 | 111.2 | 11.00 |
| 1956 | 110.5 | 11.48 |
| 1957 | 135.4 | 9.30 |
| 1958 | 121.0 | 15.00 |

Comparisons show the potential breeding population was down slightly from that of the last four years but close to the past nine-year average.

The species composition of the potential breeding population as determined on these sample check areas and compared to 1957 follows:

| <u>Species</u> | <u>1958</u> | <u>1957</u> |
|------------------|-------------|-------------|
| Mallard | 24.6 | 27.7 |
| Black Duck | 25.7 | 23.7 |
| Blue-winged Teal | 21.0 | 19.8 |
| Wood Duck | 3.3 | 4.9 |
| Ring-necked Duck | 11.8 | 7.0 |
| Merganser | 2.8 | 0.3 |
| Goldeneye | 1.5 | 0.5 |
| Pintail | - | 0.5 |
| Unidentified | 9.3 | 9.7 |

MICHIGAN - Continued

Wood Duck Surveys

Breeding population changes for wood duck were determined by float-trip censuses and by percent occupancy of nest boxes. The data collected are as follows:

Float Trips

| <u>Year</u> | <u>Lineal Miles Censused</u> | <u>Potential Breeders Per Lineal Mile</u> |
|-------------|----------------------------------|---|
| 1950 | 81 | .17 |
| 1951 | 120 | .32 |
| 1952 | 82 | .21 |
| 1953 | 95.5 | .85 |
| 1954 | 93.3 | .58 |
| 1955 | 111.2 | .70 |
| 1956 | 110.5 | .28 |
| 1957 | 135.4 | .46 |
| 1958 | 121.0 | .33 |

Nest Box Occupancy Swan Creek Wildlife Experiment Station Allegan County

| <u>Year</u> | <u>Boxes Examined</u> | <u>Occupied by Wood Ducks</u> | <u>Percent of Nest Boxes Used</u> |
|-------------|---------------------------|-----------------------------------|---------------------------------------|
| 1949 | 40 | 9 | 22.5 |
| 1950 | 35 | 10 | 28.6 |
| 1951 | 33 | 11 | 33.3 |
| 1952 | 32 | 4 | 12.5 |
| 1953 | 26 | 9 | 34.6 |
| 1954 | 24 | 8 | 33.3 |
| 1955 | 20* | 5 | 25.0 |
| 1956 | 41* | 5 | 12.2 |
| 1957 | 40* | 7 | 17.5 |
| 1958 | 36* | 5 | 11.8 |

* Metal predator-proof boxes used.

From this information we can see very little change in the number of wood ducks in Michigan.

MICHIGAN - Continued

Production Indices

The brood survey comparisons follow:

| Year | Broods Per Lineal Mile | Young Per Lineal Mile | Per Lineal Mile | Average Size of Broods Observed |
|------|---------------------------|--------------------------|--------------------|---------------------------------------|
| 1949 | .47 | 2.75 | 6.50 | 6.00 |
| 1950 | .34 | 2.32 | 5.50 | 5.87 |
| 1951 | .35 | 2.20 | 3.31 | 5.76 |
| 1952 | .70 | 3.92 | 3.21 | 4.60 |
| 1953 | .51 | 3.63 | 4.32 | 6.10 |
| 1954 | .20 | 1.67 | 4.60 | 6.24 |
| 1955 | .64 | 4.65 | 5.09 | 6.28 |
| 1956 | .53 | 3.67 | 4.40 | 5.86 |
| 1957 | .38 | 2.30 | 4.80 | 5.10 |
| 1958 | .31 | 2.18 | 6.50 | 5.97 |

Broods seen per lineal mile were slightly below those seen the last three years and also fewer than the past nine-year average. The average size of the broods remained equal to past nine-year average. The number of bachelor birds was equal to the highest year on record.

Conclusions

Judging from this information, waterfowl production in Michigan for 1958 was below that of 1955, 1956, and 1957, but without much variance from the average for the past nine years.

OHIO

Weather and Water Conditions

This was an exceptionally wet spring and flood conditions were prevalent on most streams throughout June and July. This condition made it necessary to abandon the stream survey program during this year. As a result, the wood duck nest box checks are the only "indicator" to the trend in the production of this species in Ohio during 1958.

Breeding Population and Production Indices

There were 1,226 wood duck nest boxes checked in Ohio during the last two weeks of June. Of this number only 1,024 were in useable condition. Two hundred and forty-one (23.53 percent) were utilized by wood ducks for nesting. This is an increase of 21 percent over the previous year when the degree of utilization was 19.50 percent.

Ohio Wood Duck Nest Box Checks - 1958

| | Total Boxes Checked | | Useable Boxes | | Used by Wood Duck | | Percent Used | | Percent Difference |
|-----------|------------------------|-------|------------------|-------|----------------------|------|-----------------|-------|-----------------------|
| | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | 1957 | 1958 | |
| Northwest | 332 | 239 | 332 | 227 | 67 | 57 | 20.18 | 25.11 | + 24 |
| Northeast | 115 | 137 | 104 | 109 | 19 | 32 | 18.27 | 29.36 | + 61 |
| Southeast | 324 | 280 | 267 | 217 | 36 | 24 | 13.48 | 11.06 | - 18 |
| Central | 343 | 309 | 305 | 269 | 62 | 84 | 20.33 | 31.23 | + 52 |
| Southwest | 213 | 261 | 120 | 202 | 36 | 44 | 30.00 | 21.78 | - 27 |
| TOTALS | 1,327 | 1,226 | 1,128 | 1,024 | 220 | 241 | 19.50 | 23.53 | + 21 |

Conclusions

On the basis of the wood duck nest box checks it appears that there will be an increase over the previous year in the wood duck production in Ohio.

INDIANABreeding Population Indices

The reproductive success of the wood duck has received primary consideration, and has been investigated by systematic coverage on nine stream sections totaling 143 miles. The stream sections and methods have been unchanged since 1952, and essentially unchanged since 1950.

Three stream sections totaling 47 miles have been covered between April 24 and May 9 in 1952, 1953, 1955, 1956, 1957, and 1958. Eighty-four males and 37 female wood ducks were observed this year. Observed males were 87 percent above the figure for 1957, and 47 percent above the previous five-year average. Observed females were 118 percent above those of 1957, and 58 percent above the previous five-year average. No wood duck broods were observed on the preliminary survey this year, compared to one brood in 1957, and two broods in each of 1956 and 1955.

Production Indices

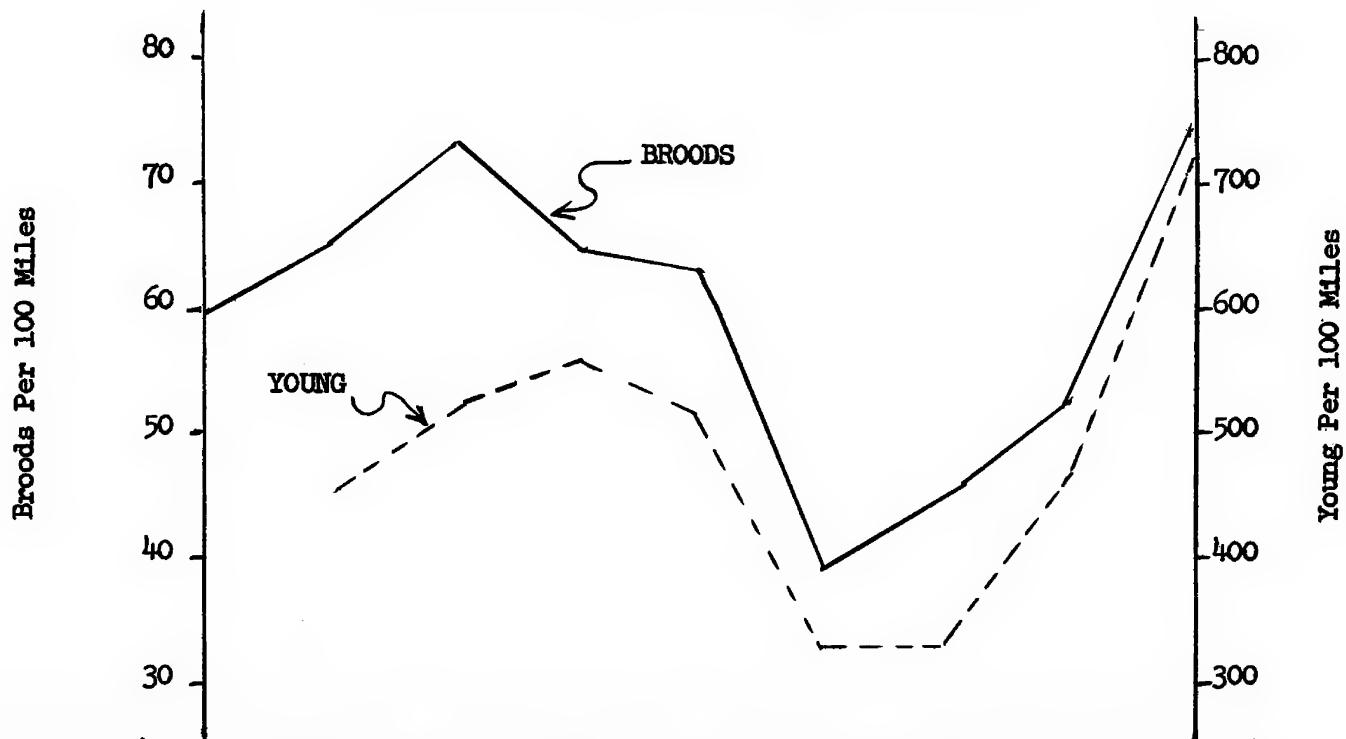
Nine stream sections totaling 143 miles have been covered between May 22 and June 20, since 1950. A total of 98 wood duck broods was observed this year. This figure has been adjusted upward to 106 broods in this report, for the following reasons. Water levels were considered satisfactory for brood-counts on seven of the nine stream sections. On June 10 the Iroquois River Section was in flood and one brood was observed. It is believed that the adult population observed on this float justifies an estimate of at least four broods for this section, which is the previous six-year average. On June 12 the Maumee River section was also in flood, and only one brood was observed. Again it is believed that the adult population observed, and the responses of several flushed females, justifies an estimate of at least six broods for this section, which is also the previous six-year average.

The adjusted brood-count of 106 broods is 41.4 percent over 1957, and 32.5 percent above the previous six-year average. Whole counts were obtained on 67 broods. Brood size averaged 9.7 and ranged from one to 16 (Figure 1).

Brood age distribution for the 98 broods observed indicates the timing of the floats was fair to good, with a slight skewness toward the younger age groups: I-a, 8; I-b, 28; I-c, 28; II-a, 23; II-b, 9; II-c, 2; and III, none.

WOOD DUCK BROODS AND YOUNG PER 100 MILES OF COMPARABLE
STREAM SECTIONS - INDIANA 1950 THROUGH 1958

101



| Year | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 |
|----------------------------------|------|------|------|------|------|------|------|------|------|
| Broods Per 100 Miles | 59.2 | 64.2 | 72.3 | 63.6 | 62.2 | 39.2 | 46.2 | 52.5 | 74.2 |
| Average Brood Size ^{/1} | - | 7.1 | 7.1 | 8.8 | 8.3 | 8.6 | 7.3 | 8.9 | 9.7 |
| Young Per 100 Miles | - | 456 | 513 | 560 | 516 | 337 | 337 | 467 | 720 |

^{/1} Average brood size determined from whole counts only.

INDIANA - ContinuedConclusions

All indications point to a very successful reproductive season so far, for the wood duck in Indiana. Reports from almost every section are favorable. This is the third successive year showing an increase in the wood duck brood-count, since the low of 1955. This year, three of the nine stream sections had brood-counts exceeding their respective all-time high counts, six of the nine have equaled or exceeded their respective figures for 1957, and six, including the two estimated at the average, have equaled or exceeded their respective six-year averages. Brood size is also at an all time high, however, a portion of this may be a reflection of the greater number of broods in the younger age classes.

IOWAWeather and Water Condition

Many prairie marshes remain dry because of the semi-drought conditions of the last few years. However, except for some severe local flooding, weather and water conditions have been excellent for waterfowl production and survival.

Breeding Population and Production Indices

Emphasis has been placed upon the study of the wood duck because the production of this species in Iowa is of importance to the flyway population. The blue-winged teal and mallard are common nesters, but not numerically of great importance to the flyway. During 1958, nesting pintails have appeared in Iowa's lake region in the largest numbers observed during the past nine years. Total pintail production in this State is only a "drop in the bucket," but the response of this species to local habitat (phenological) conditions in 1958 may be indicative of a widespread dispersal of this species throughout other suitable fringe areas of its range.

The wood duck production trend in Iowa appears upward in 1958. Stream survey data and nesting box checks indicate this, but the data are too limited to provide an estimate of the percentage of increase.

The trend of blue-winged teal and mallard production in Iowa appears upward. More of these ducks have been observed during 1958 than in any nesting season since. 1951.

Conclusions

Total production, with the exception of pintails, is still below the peak production year of 1951 in Iowa, but is improved over 1957.

MISSOURI

Breeding Population and Production Data

Tables 1 and 2 show nesting efforts and trends of wood ducks, mallards, and blue-wing teal since 1953. Conservation agents, Federal-Aid biologists, State area managers, and Federal refuge supervisors censused 6,871 acres of marsh and 613 miles of stream in the 1958 survey. We had a 16 percent increase in acres of marsh censused over 1957 but due to high water in many southern streams there was a 20 percent drop in miles of stream surveyed.

Wood duck nesting efforts per square mile of lake and marsh (Table 2) increased by 55 percent over the 1957 figure. The chart shows a jump from 3.8 attempts per square mile to 5.9.

This increase is partially due to the high rate of production on a few of our State managed areas. Duck Creek Public Shooting Area in southeast Missouri reported a 41 percent usage on 81 wood duck boxes. During 1957 there was a 37-1/2 percent usage on 56 boxes. Fourteen broods were reported observed on the Duck Creek area during the 1958 survey.

The Trimble Wildlife Area, located in Northwest Missouri, also reported an increase in wood duck usage. Seven broods were reported using 150 acres of marsh with one brood containing 22 young.

Even though we had a few area that reported high productivity, nesting success over most of the State remained at the 1957 level.

Wood duck nesting success on the stream of the State took a slight increase. The six year low on stream surveys occurred in 1956 when nesting attempts dropped to .10 per mile of stream. 1957 shows a very slight increase to .13 with 1958 still increasing to .15 (Table 2).

Average numbers of ducklings in Class I age group increased by 28 percent or a 2 ug. per brood average. Class II age group remained approximately the same as in 1957. The Class III group increased by 23 percent.

Mallard nesting efforts per square mile of marsh and lake have fluctuated from 2.5 in 1955 to 6.5 in 1957. This year there was a decrease in nesting efforts of mallards to 3.0 per square mile. Although fewer lone drakes, lone hens and pairs were observed in 1958, we did have a slight increase in mallard broods observed.

Conclusions

It is estimated that the fall flight of wood duck from Missouri will be about the same as 1957 but there will be a decrease in the flight of mallard and blue-winged teal.

Table 1--Nesting Efforts of Wood Duck, Mallard, and Blue-winged Teal, Waterfowl Nesting Survey,
South and North Missouri, June 1-15, June 15-30

| 6871 Acres of Lake and Marsh | Lone Drake | Lone Hen | Pairs | No. | Broods Total Young | Average Young Per Brood | Total Nesting Effort | Nesting Effort per Square Mile |
|---------------------------------|------------|----------|-------|-----|--------------------------|-------------------------------|----------------------------|--|
| Wood Duck | 7 | 14 | 6 | 37 | 290 | 7.8 | 64 | 5.9 |
| Mallard | 13 | 6 | 6 | 3 | 15 | 5.0 | 28 | 2.6 |
| Blue-winged Teal | - | 1 | 3 | 1 | 2 | - | 5 | .46 |
| Lake and Marsh Totals | 20 | 21 | 15 | 41 | 307 | 6.4 | 97 | 8.9 |
| 613 Miles of Stream | | | | | | | | Nesting Effort per Mile of Stream |
| Wood Duck | 21 | 24 | 16 | 30 | 224 | 7.5 | 91 | .15 |
| Mallard | 13 | 9 | 1 | 2 | 18 | 9.0 | 25 | .04 |
| Blue-winged Teal | 1 | - | 2 | - | - | - | 3 | .005 |
| Stream Totals | 35 | 33 | 19 | 32 | 224 | 8.25 | 119 | .19 |
| GRAND TOTAL | 55 | 54 | 34 | 73 | 531 | 7.3 | 216 | |

Table 2--Trend Data, Wood Duck Nesting Survey, 1953-1958

| | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | Per Cent Change |
|---|------|------|------|------|------|------|--------------------|
| Acres of lake and marsh censused | 4976 | 4931 | 7110 | 2222 | 5897 | 6871 | / 16 |
| Miles of stream censused | 371 | 581 | 666 | 564 | 774 | 613 | - 20 |
| Nesting effort per sq. mi. of lake and marsh | 5.8 | 4.4 | 3.6 | 3.1 | 3.8 | 5.9 | / 55 |
| Nesting effort per mile of stream | .24 | .22 | .13 | .10 | .13 | .15 | / 15 |
| Number of broods (stream) | 42 | 31 | 28 | 23 | 37 | 37 | - |
| Broods per mile of stream | .09 | .04 | .03 | .04 | .04 | .04 | - |
| Av. No. ducklings, Class I | 4.9 | 5.8 | 7.3 | 6.3 | 7.0 | 9.0 | / 28 |
| Av. No. ducklings, Class II | 4.4 | 7.2 | 6.2 | 5.8 | 6.0 | 6.3 | / .05 |
| Av. No. ducklings, Class III | 4.6 | - | - | 7.0 | 6.1 | 7.5 | / 23 |
| Av. No. ducklings, all classes | 4.5 | 6.5 | 6.7 | 6.4 | 6.1 | 7.6 | / 24 |

Table 3--Trend Data, Mallard and Blue-winged Teal Nesting Survey, Missouri, 1953-1958

| | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | Per Cent Change |
|--|------|------|------|------|------|------|--------------------|
| Acres of lake and marsh | 4976 | 4931 | 7110 | 2222 | 5897 | 6871 | / 16 |
| Miles of stream censused | 371 | 581 | 666 | 564 | 774 | 613 | - 20 |
| Nesting effort per sq. mile of lake and marsh | 4.0 | 2.7 | 2.5 | - | 6.5 | 3.0 | - 53 |
| Nesting effort per mile of stream | .19 | .12 | .03 | - | .07 | .04 | - 42 |

Atlantic Flyway DataWaterfowl Kill Information

The following table presents the estimated number of waterfowl bagged and waterfowl knocked down but not retrieved during the 1956-57 and 1957-58 shooting seasons as determined by the Waterfowl Hunter Mail Survey:

| Species | 1957-1958 | 1956-1957 | Percent Change 1956-1957 to 1957-1958 |
|---------------------------|-----------|-----------|---|
| Black | 288,311 | 344,725 | - 16.36 |
| Mallard | 262,220 | 279,810 | - 6.29 |
| Canvasback | 72,888 | 98,604 | - 26.08 |
| Wood Duck | 74,853 | 83,073 | - 9.89 |
| Scaup | 107,972 | 75,906 | / 42.24 |
| G-W. Teal | 60,096 | 67,177 | - 10.54 |
| B-W. Teal | 39,860 | 52,091 | - 23.48 |
| Am. Wigeon | 77,117 | 48,453 | / 59.16 |
| Pintail | 58,833 | 43,833 | / 34.22 |
| Goldeneye | 35,852 | 40,142 | - 10.44 |
| Redhead | 28,226 | 39,873 | - 29.21 |
| Merganser | 43,959 | 38,404 | / 14.46 |
| Ring-necked | 31,740 | 34,902 | - 9.06 |
| Scooter | 35,709 | 32,100 | / 11.24 |
| Ruddy | 16,722 | 26,119 | - 35.98 |
| Bufflehead | 38,064 | 23,641 | / 61.01 |
| Shoveler | 11,452 | 6,830 | / 67.67 |
| Gadwall | 11,998 | 6,425 | / 86.74 |
| Others | 5,466 | 4,944 | / 10.56 |
| Total Ducks Retrieved | 1,301,338 | 1,347,052 | N.C. |
| Total Ducks not retrieved | 288,708 | 411,277 | - 29.80 |
| Total Duck Kill | 1,590,046 | 1,758,329 | - 9.57 |
| Canada Goose | 98,365 | 58,898 | / 67.01 |
| Brant Goose | 16,355 | 6,251 | / 161.64 |
| Other Geese | 792 | 955 | - 6.96 |
| Total Geese Retrieved | 115,513 | 66,104 | / 74.74 |
| Total Geese not retrieved | 15,444 | 12,793 | / 20.72 |
| Total Goose Kill | 130,952 | 78,897 | / 65.98 |
| Total Coot Retrieved | 97,313 | 105,694 | - 7.93 |
| Total Coot not retrieved | 26,280 | 24,687 | / 6.45 |
| Total Coot Kill | 123,593 | 130,381 | - 5.21 |

Atlantic Flyway Data

Number of Hunters, Average Times Hunted, Seasonal Bag, Seasonal Unretrieved Kill
and Daily Bag as Determined by the Waterfowl Hunter Mail Survey

| | | 1957-1958 | 1956-1957 | Percent Change 1956-1957 to 1957-1958 |
|--------------------------------------|-------|-----------|-----------|---|
| Number of Potential Hunters | | | | |
| Over 15* | | 357,130 | 377,689 | - 5.44 |
| Under 16 | | 19,212 | 23,746 | - 19.09 |
| | | 376,342 | 401,435 | - 6.25 |
| Number of Active Hunters** | | | | |
| Over 15 | | 299,618 | 308,957 | N.C. |
| Under 16 | | 13,844 | 17,556 | - 21.14 |
| | | 313,462 | 326,513 | - 4.00 |
| Average Times Hunted** | | 4.157 | 4.272 | N.C. |
| Average Seasonal Bag** | | | | |
| <u>Over 15</u> | Ducks | 4.263 | 4.240 | N.C. |
| | Geese | .378 | .209 | / 80.86 |
| | Coot | .313 | .307 | N.C. |
| <u>Under 16</u> | Ducks | 1.746 | 2.108 | - 17.17 |
| | Geese | .172 | .091 | / 89.01 |
| | Coot | .251 | .622 | - 59.65 |
| Average Seasonal No. not retrieved** | | | | |
| <u>Over 15</u> | Ducks | .937 | 1.290 | - 27.36 |
| | Geese | .049 | .040 | / 22.50 |
| | Coot | .082 | .065 | / 26.15 |
| <u>Under 16</u> | Ducks | .579 | .730 | - 20.68 |
| | Geese | .053 | .029 | / 82.76 |
| | Coot | .20 | .255 | - 52.94 |
| Average Daily Bag** | | | | |
| <u>Over 15</u> | Ducks | 1.025 | .993 | N.C. |
| | Geese | .091 | .049 | / 85.71 |
| | Coot | .073 | .072 | N.C. |
| <u>Under 16</u> | Ducks | .420 | .493 | - 14.81 |
| | Geese | .041 | .021 | / 95.24 |
| | Coot | .060 | .146 | - 58.90 |

* Individuals who purchased a Duck Stamp with intent to hunt.

** Individuals who hunted at least once. 110

Winter Trend Data - Atlantic Flyway

Weather conditions during the period when the winter survey was conducted were not particularly favorable. Therefore, there is some possibility that part of the decrease in wintering population that was recorded was due to adverse survey conditions rather than less birds. On the basis of coverage of the same areas during 1957 and 1958 there was a 25 percent decrease in ducks, a 10 percent decrease in geese, a 22 percent increase in brant, a 31 percent decrease in swan, and a 37 percent decrease in coot. Species composition and percent change by individual species are presented in the table which follows. In the graph which follows are presented trends in duck, goose, brant, swan, and coot populations for the Atlantic Flyway for the period 1949 through 1958. The data have been adjusted for comparable coverage between years.

In the graph it will be noted that there has been a general trend downward in the duck populations, which reached a peak in 1953. The present level of duck populations is well below the average for the past 10 years.

Species Composition - Atlantic Flyway - 1957 and 1958
(Comparable Coverage)

| Species | <u>Percent of Birds Identified</u> | | Percent Change |
|-------------------|------------------------------------|------|----------------|
| | 1957 | 1958 | |
| Coot | 16.3 | 13.3 | - 36.7 |
| Scaup | 16.1 | 17.1 | - 17.9 |
| Black Duck | 11.6 | 8.8 | - 41.1 |
| Canada Goose | 9.8 | 10.9 | - 14.0 |
| Mallard | 9.7 | 5.7 | - 54.4 |
| Pintail | 5.8 | 6.2 | - 16.3 |
| Canvasback | 4.8 | 2.6 | - 57.3 |
| Am. Brant | 4.3 | 6.8 | / 22.4 |
| Baldpate | 2.8 | 3.9 | / 5.9 |
| Ringneck | 2.6 | 2.4 | - 28.5 |
| Redhead | 2.4 | 3.9 | / 24.0 |
| Scoter & Eider | 2.4 | 4.0 | / 31.8 |
| Goldeneye | 2.4 | 1.3 | - 58.4 |
| Ruddy | 1.6 | 3.9 | / 91.0 |
| Merganser | 1.1 | 1.4 | - 0.8 |
| Whistling Swan | 1.1 | 1.0 | - 30.8 |
| Green-winged Teal | 1.0 | 1.8 | / 35.9 |
| Snow Goose | .9 | 1.6 | / 33.1 |
| Gadwall | .8 | 1.1 | / 8.6 |
| Shoveler | .7 | .4 | - 48.0 |

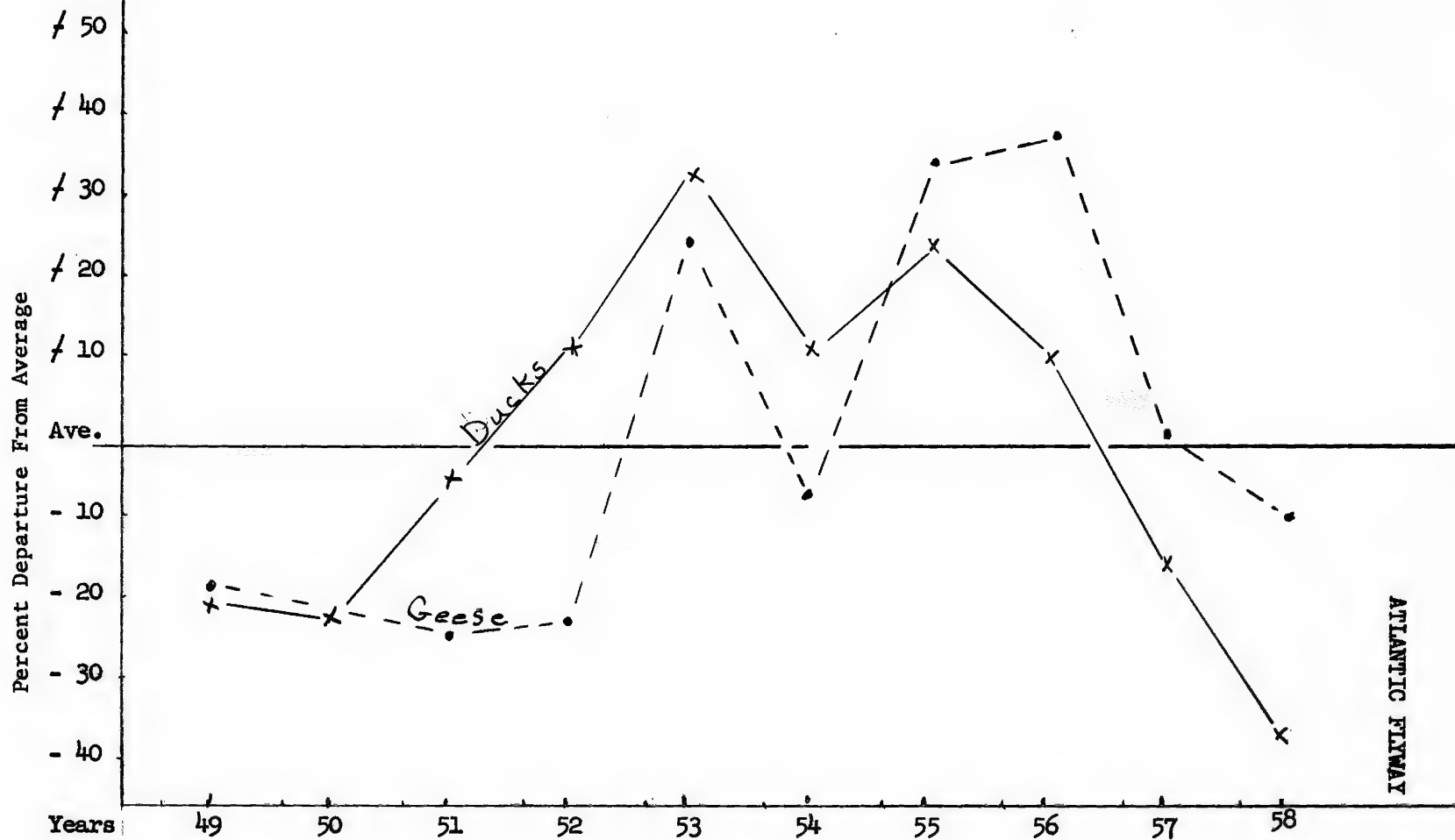
Continued --

Species Composition - Atlantic Flyway - Continued

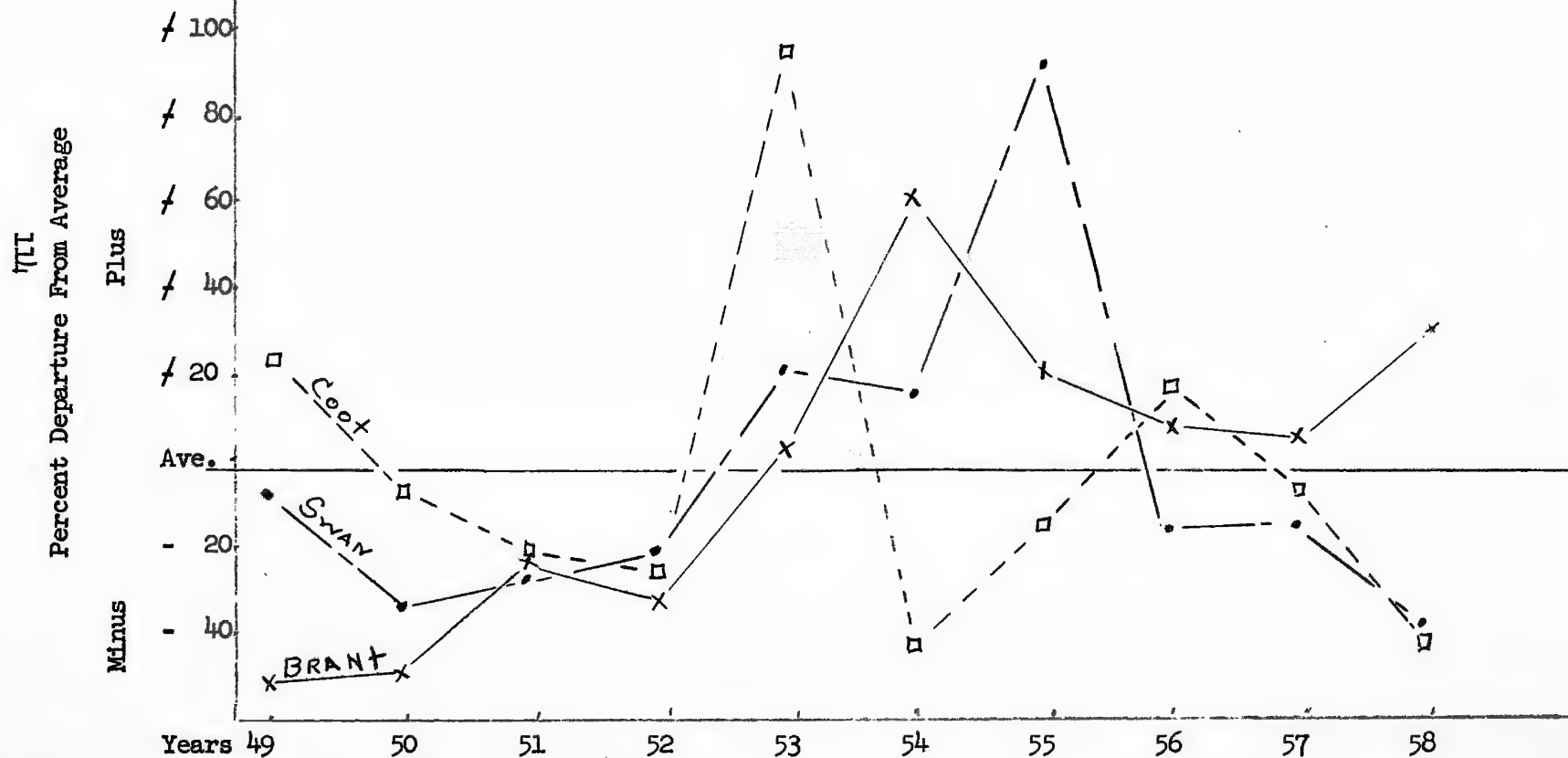
| Species | Percent of Birds Identified | | Percent Change |
|------------------|-----------------------------|-------|-------------------|
| | 1957 | 1958 | |
| Bufflehead | .6 | .8 | / 12.3 |
| Old Squaw | .5 | .3 | - 53.2 |
| Wood Duck | .5 | .4 | - 29.7 |
| Blue-winged Teal | .2 | .4 | / 8.3 |
| Blue Goose | Tr. | Tr. | - |
| TOTAL | 100.0 | 100.0 | - 23.5 |

Trend in Duck and Goose Populations in Atlantic Flyway
1949 Through 1958 (Comparable Coverage)

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Trend in Brant, Swan and Coot Populations in Atlantic Flyway
1949 Through 1958 (Comparable Coverage)



MARITIME PROVINCES:Weather and Water Conditions

In general spring was early in the Maritimes; about two or three weeks earlier than 1957. Mean monthly temperatures from January to May inclusive were above normal in all three provinces. However, there was considerable variation in precipitation and water levels in the three provinces.

Except for March, total monthly precipitation from January to May was excessive in Nova Scotia and New Brunswick. The combination of above normal temperatures and excessive precipitation (snow in northern N.B.) resulted in a larger than usual April run-off and water levels have remained high during May and June as a result of the continued excessive precipitation. Flood conditions prevailed in parts of N.B. and N.S. during the last two weeks of April; residents in the Saint John River valley experienced one of the worst floods in over twenty years. In contrast, April and May were dry months on Prince Edward Island with deficiencies in monthly precipitation of 30 to 40 percent occurring in most areas. There were no flood conditions on the island and spring run-off was about normal.

Some flooding of Black Duck nests may have occurred in N.B. and N.S. early in the season; however, field surveys in June and July indicate that weather and water conditions generally in the Maritimes have been favourable for nesting waterfowl.

Breeding Population Data

A comparison of the counts obtained during the spring breeding-pair survey (Table I) indicate no appreciable changes in the Black Duck and Goldeneye breeding populations. However, both the spring pair and summer brood surveys (Tables 1 and 2) suggest an increase in the breeding population of Ring-necked Duck; a return to the 1956 population level. The suggested decreases in Teal and Pintail breeding populations are of the same magnitude as last year's decreases. Due to the small number of birds (Teal and Pintail) observed, the counts obtained in our surveys are probably not reliable indices of changes in breeding population.

TABLE I

Spring waterfowl inventory, Maritime Provinces, 1957 and 1958 (Comparable data for principal breeding species)

| Type of Survey | Year | Species | | | | |
|----------------------|------|-----------------------|-------------------------|------------------------|----------------------|----------------------|
| | | <u>Black Duck</u> | <u>Ring-n. Duck</u> | <u>Golden- eye</u> | <u>B.W. Teal</u> | <u>Pin- tail</u> |
| Aerial | 1957 | 1,257 | 134 | 136 | 77 | 79 |
| | 1958 | 968 | 185 | 132 | 43 | 4 |
| Ground | 1957 | 679 | 148 | 145 | 71 | 39 |
| | 1958 | 855 | 220 | 140 | 63 | 57 |
| Total | 1957 | 1,936 | 282 | 281 | 148 | 118 |
| | 1958 | 1,823 | 405 | 272 | 106 | 61 |
| Percentage Change | | -6 | 44 | -3 | -28 | -48 |

Production Data

(a) Black Duck

Brood averages are very close to the 1957 averages (Table 3). However, the high young to adult ratio (Table 2), and the large number of Class III broods observed on the survey suggests that production in 1958 will exceed both 1957 and 1956 production.

(b) Ring-necked Duck

Thirteen broods of this species were observed on the transects this year as compared to two broods in 1957. Although the number of birds observed is small, our data suggest an increase in production from 1957.

(c) Others

The available data suggest that there will be no appreciable changes from 1957 in the production of Goldeneye, Blue- and Green-winged Teal and Pintail.

Table II - Summer brood survey, Maritime Provinces, 1956, 1957 and 1958
(Comparable data for principal breeding species)

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| Type of Survey | Area | Year | Species | | | | | | | | | | | | | |
|----------------------|--------|------|------------|-----|-----|----------------|--------------|-----|-----|-----------|-----|-----|------|-----|-----|-----|
| | | | Black Duck | | | | Ring-n. Duck | | | Goldeneye | | | Teal | | | |
| | | | Ad. | Br. | Yg. | Yg./100 Ad. | Ad. | Br. | Yg. | Ad. | Br. | Yg. | Ad. | Br. | Yg. | |
| Ground | N.B. | 1956 | 271 | 27 | 175 | 64 | 59 | | | | 44 | 8 | 50 | 69 | 13 | 93 |
| | and | 1957 | 223 | 21 | 172 | 77 | 51 | | | | 49 | 12 | 85 | 37 | 4 | 36 |
| | N.S. | 1958 | 131 | 25 | 195 | 149 | 81 | 5 | 51 | 77 | 16 | 77 | 93 | 11 | 87 | |
| Aerial | P.E.I. | 1956 | 406 | 36 | 234 | 58 | 89 | | | | 45 | 5 | 40 | 123 | 15 | 103 |
| | | 1957 | 268 | 24 | 170 | 63 | 84 | 2 | 13 | 6 | | | 83 | | | |
| | | 1958 | 345 | 42 | 314 | 91 | 1 | 4 | | | | | 60 | | | |

Table III - Average brood sizes by age classes, 1956, 1957 and 1958

| Species | Class I | | Class II | | Class III | | Total |
|-------------------------|------------|-------------|------------|-------------|------------|-------------|---------------|
| and | Av. | | Av. | | Av. | | |
| <u>Year</u> | <u>Br.</u> | <u>Size</u> | <u>Br.</u> | <u>Size</u> | <u>Br.</u> | <u>Size</u> | <u>Broods</u> |
| <u>Black Duck</u> | | | | | | | |
| 1956 | 25 | 6.8 | 43 | 6.3 | 4 | 5.5 | 72 |
| 1957 | 19 | 8.7 | 50 | 7.7 | 9 | 8.0 | 78 |
| 1958 | 18 | 8.2 | 49 | 7.5 | 31 | 6.7 | 98 |
| <u>Goldeneye</u> | | | | | | | |
| 1956 | 8 | 5.6 | 6 | 7.0 | | | 14 |
| 1957 | 8 | 5.0 | 7 | 9.4 | 1 | 8.0 | 16 |
| 1958 | 8 | 6.5 | 8 | 3.1 | | | 16 |
| <u>B.W. Teal</u> | | | | | | | |
| 1956 | 11 | 7.6 | 2 | 5.0 | | | 13 |
| 1957 | 9 | 9.8 | 5 | 8.8 | 1 | 3.0 | 15 |
| 1958 | 7 | 9.7 | 6 | 10.3 | | | 13 |
| <u>Ring-necked Duck</u> | | | | | | | |
| 1956 | | | | | | | |
| 1957 | 1 | 8.0 | 1 | 5.0 | | | 2 |
| 1958 | 10 | 9.1 | 3 | 10.0 | | | 13 |
| <u>Pintail (P.E.I.)</u> | | | | | | | |
| 1956 | | | | | | | |
| 1957 | 1 | 9.0 | 2 | 7.0 | 1 | 10.0 | 4 |
| 1958 | 2 | 8.0 | 1 | 8.0 | 1 | 4.0 | 4 |

Conclusions

Available data indicate an increase from 1957 in the production of Black Duck and Ring-necked Duck. Production of other species will probably be equal to the 1957 production.

NORTHEASTERN STATES

Weather and Water Conditions

This production season can be characterized as cool and wet. It is a direct contrast to the 1957 season and is in many aspects similar to the 1956 season.

Precipitation during the period of April to July was above normal over most of the northeast; only portions of the Lake Plains were below normal during late May and early June.

Water levels are currently normal or above over all of the northeast.

Vegetation responded to the early spring breakup but was then retarded due to the generally cool days and cold nights. Growth rate has progressed toward "normal" south to north with portions of northern New England still retarded.

In the coastal areas seasonal high tides are reported to have flooded nests in late April and early May.

Breeding Population

Early reports throughout the northeast were generally optimistic. Later, portions of southern New England indicated the breeding population was down. This was particularly true of the Black duck. Ring-necked duck breeding populations were generally considered above last year where this species occurred.

Production Data

While early nesting was the general rule, the apparent success was below normal. Many of the early class I broods observed numbered only one or two young. Most observers feel that the nesting season was prolonged this year. Re-nesting is reported heavy throughout much of the region. In the coastal areas and portions of the interior late broods are noticeably larger.

Brood rearing conditions have been recorded from good to excellent. The continued high water levels have increased the amount of brood cover normally available. Broods have been reported from areas not normally flooded during the area surveys. This has hindered the observers in evaluating production.

The narrative reports of many observers are more optimistic than the data submitted would indicate. This may be due to their inability to accurately count birds under the field conditions current this year.

When considering the data in Tables I and II the foregoing discussion should be taken into consideration.

Table I indicates a rather severe decrease in production for approximately 50 percent of the 121 comparable areas. In some instances this decrease was very small.

Table II from the 110 comparable areas shows a decrease in production for all species except the Ring-necked duck. Brood size is up for all species while the number of young birds shows a decrease. This could be due to the greater rearing success of the June hatched broods.

Conclusions

Interpretation of the data is difficult but pessimistic as follows:

| | | |
|------------|---|-----------------------------|
| Black duck | - | slight to moderate decrease |
| Wood duck | - | no change |
| Mallard | - | slight decrease. |

TABLE I

Number of Comparable Areas by States Showing Status of Production

| <u>State</u> | <u>Comparable Areas</u> | <u>Increase</u> | <u>No. Change</u> | <u>Decrease</u> |
|---------------|-----------------------------|-----------------|-------------------|-----------------|
| Connecticut | 46 | 10 | 16* | 20 |
| Delaware | 7 | 0 | 0 | 7 |
| Maine | 18 | 10 | 1 | 7 |
| Massachusetts | 2 | 0 | 0 | 2 |
| New Hampshire | 6 | 2 | 1 | 3 |
| New Jersey | 9 | 5 | 0 | 4 |
| New York | 5 | 1 | 0 | 4 |
| Rhode Island | 19 | 5 | 1 | 13 |
| Vermont | 7 | 5 | 1 | 1 |
| West Virginia | 2 | 1 | 0 | 1 |
| | — | — | — | — |
| TOTAL | <u>121</u> | <u>39</u> | <u>20</u> | <u>62</u> |

*Includes 11 areas with no ducks observed in 1958 or 1957.

TABLE II -- Summer Brood Survey in the Northeastern States, 1958
(110 Comparable Areas, Table I)

| Species | Total Broods | | Young Produced | | Average Brood | | Percent of Change | | | |
|------------------|--------------|------------|----------------|----------------|---------------|------------|-------------------|-------------|-----------|-------------|
| | 1958 | 1957 | 1958 | 1957 | 1958 | 1957 | Young Produced | | Broods | |
| | | | | | | | In-crease | De-crease | In-crease | De-crease |
| Black duck | <u>232</u> | <u>318</u> | <u>1,534.6</u> | <u>2,062.7</u> | <u>6.6</u> | <u>6.5</u> | — | <u>25.6</u> | — | <u>27.0</u> |
| 123 Wood duck | <u>193</u> | <u>224</u> | <u>1,412.0</u> | <u>1,514.5</u> | <u>7.3</u> | <u>6.8</u> | — | <u>6.8</u> | — | <u>13.8</u> |
| Mallard | <u>76</u> | <u>107</u> | <u>496.4</u> | <u>598.7</u> | <u>6.5</u> | <u>5.6</u> | — | <u>17.1</u> | — | <u>29.0</u> |
| Ring-necked duck | <u>24</u> | <u>27</u> | <u>177.6</u> | <u>164.0</u> | <u>7.4</u> | <u>6.1</u> | <u>8.3</u> | — | — | <u>11.1</u> |
| Blue-winged teal | <u>23</u> | <u>35</u> | <u>201.1</u> | <u>290.3</u> | <u>8.7</u> | <u>8.3</u> | — | <u>30.7</u> | — | <u>34.3</u> |

SUMMARY OF CONDITIONS

PACIFIC FLYWAY

On the basis of data collected in Alaska, Canada, and the United States only, the wintering population of ducks increased considerably in the Pacific Flyway as compared to a year ago. Small increases for geese and swan were also recorded. There were small decreases in the wintering population of brant and coot.

Data gathered on the breeding grounds supplying the Pacific Flyway supported the increase recorded on the wintering areas. There were considerable increases in the breeding populations recorded in Alaska, Alberta, and the Northwest Territories. Elsewhere the breeding population remained about the same.

For the most part the breeding areas supplying the Pacific Flyway were characterized by an early dry season. In Alaska and northern Canada this type of season is generally favorable to waterfowl production, since the amount and quality of water areas are usually not affected by drought conditions. In much of the Canadian prairie nesting habitat supplying the Flyway drought conditions prevailed until early summer. Beginning in June and continuing in July, sufficient rain occurred to maintain adequate water for brood production. Although water levels were normal to low in Wyoming, they were judged to be very good to excellent in Oregon, Idaho, California, Nevada, and Utah.

Brood surveys in July indicate that this is a record year for production in southern Alberta. In southern Saskatchewan, however, drought conditions were more severe and a decrease is expected. On the basis of an increased breeding population and favorable conditions, production is expected to increase in Alaska, Northwest Territories, northern Alberta, British Columbia, Idaho, Utah, Nevada, and California. Decreases are expected from northern Saskatchewan, Oregon, and Washington.

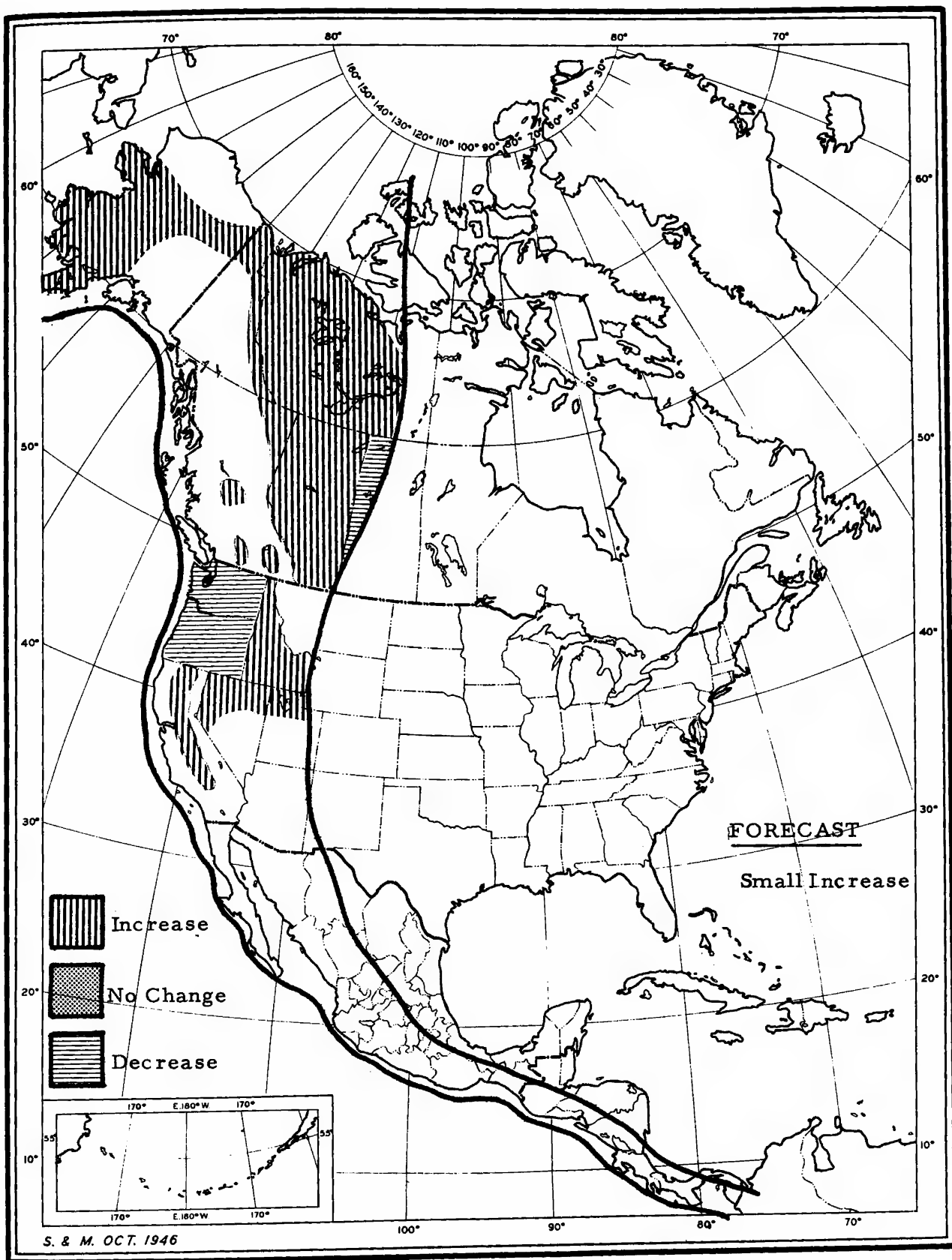
Overall, it is expected that the fall flight of ducks in the Pacific Flyway will show a small increase over last year.

On the basis of a small increase in the breeding population of geese in the Flyway as measured by the winter survey, it is estimated that there will be a small increase in the fall flight of this group of species.

Both the breeding population and production of coot increased in southern Alberta. However, there were marked reductions in both breeding population and production in other important prairie nesting areas. On this basis it is estimated that the fall flight of coot will remain about the same or decrease.

In view of the small decrease in the breeding population of brant, as measured by the annual winter survey, plus the fact that there seems to be a continuing downward trend in the population of this species, it is estimated that there will be a small decrease in the fall flight of brant in the Pacific Flyway.

1958 FALL FLIGHT FORECAST FOR DUCKS PACIFIC FLYWAY



CENTRAL FLYWAY

Due to circumstances beyond control it was not possible to conduct the annual survey in Mexico during January 1957. Although the Mexican survey was conducted in January 1958, comparisons cannot be made between the two years in this important Central Flyway wintering area. On the basis of coverage within the United States only, there would appear to have been a considerable decrease in wintering populations between 1956 and 1957, and a compensating increase between 1957 and 1958. When the breeding population survey indices are used as an indicator of population trend it appears doubtful that the decrease recorded in 1957 took place. It appears also that although there has been an increase in breeding population within the Central Flyway this year that the increase has been small and not nearly of the magnitude indicated by the winter survey results.

Throughout most of the breeding range affecting the Central Flyway the season was from one to two weeks early. Much of the Flyway breeding range was characterized by drought during the 1958 season. In southern Saskatchewan and North Dakota the effect of the drought was apparently more severe than in either southern Alberta or southern Manitoba. Drought conditions prevailed also in breeding areas further north, but in northern habitat lack of rain can have a favorable rather than a detrimental effect. During June and July, general rains occurred in the Dakotas, southern Alberta, and southern Manitoba. These rains halted the drying trend and improved conditions for brood production. The first general rain in southern Saskatchewan occurred on July 12 and 13 which improved conditions somewhat for renesters but did little to help early hatched broods.

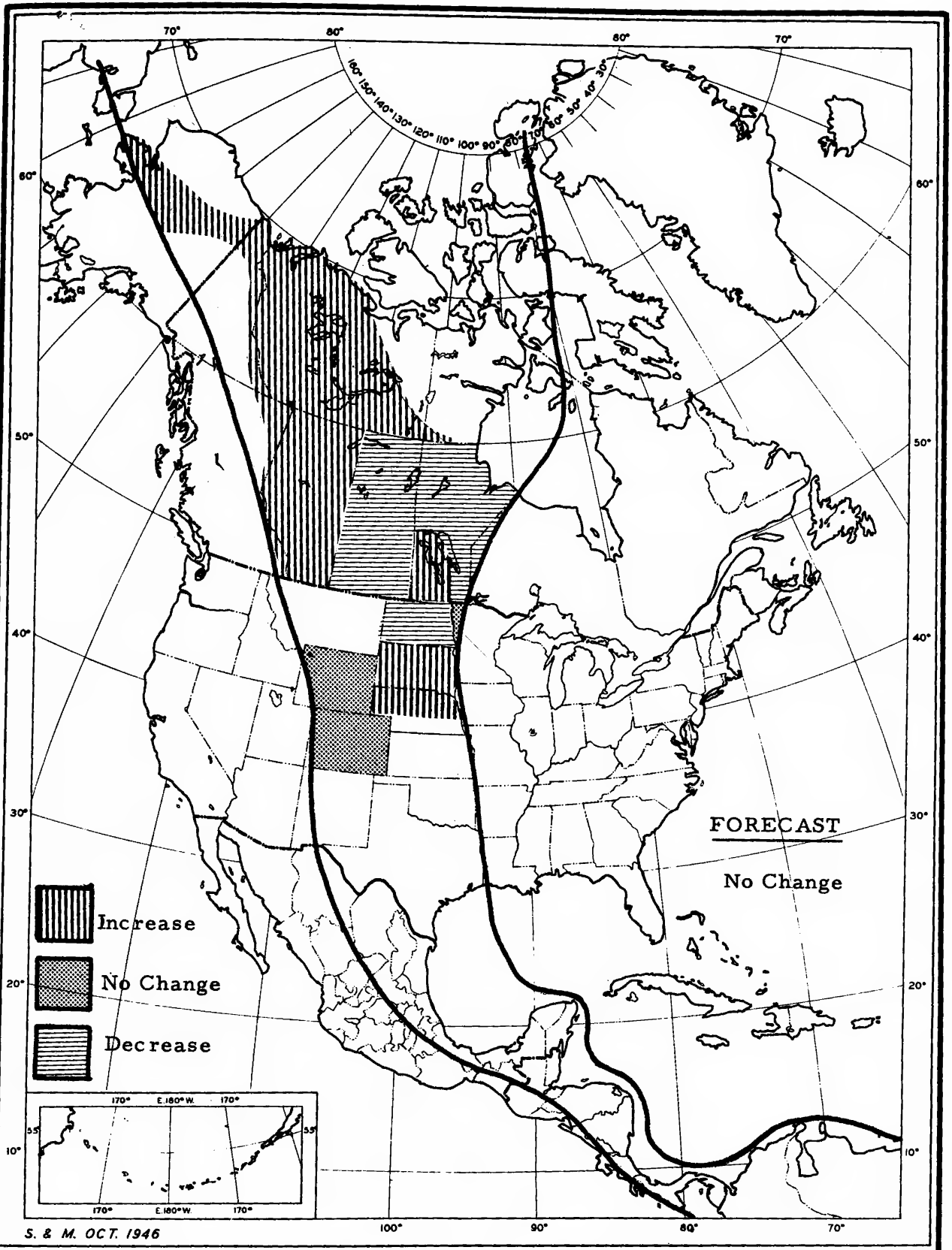
The July surveys revealed increases in brood production in southern Alberta, southern Manitoba, and South Dakota. In view of larger breeding populations and favorable weather conditions, increases in brood production are expected in Alaska and the Northwest Territories. Decreases in production were recorded throughout Saskatchewan and in Northern Manitoba, Ontario, and North Dakota. Production was estimated to be about the same as last year in Wyoming, Colorado, and Minnesota.

Overall, a summation of field reports indicates that there should be no change in the fall flight of ducks in the Central Flyway as compared to 1957.

On the basis of an increase in the breeding population of geese, as measured by the 1958 winter survey, it is estimated that there will be a small increase in the fall flight of this group of species.

Although there was a marked increase in the breeding population of coot in southern Alberta and southern Manitoba, there was a greater decrease in southern Saskatchewan. Also, there was a marked reduction in brood production in southern Saskatchewan and southern Manitoba. Therefore, it is concluded that there will be a moderate decrease in the fall flight of this species.

1958 FALL FLIGHT FORECAST FOR DUCKS CENTRAL FLYWAY



MISSISSIPPI FLYWAY

The 1958 winter survey in the Mississippi Flyway showed little change in population of ducks and geese as compared to 1957. The wintering population of coot increased considerably although the number of coot wintering in the Mississippi Flyway is relatively small.

On the breeding grounds, surveys during May and June revealed small increases in breeding population in southern Alberta, southern Manitoba, Alaska, Northwest Territories, Ontario, and South Dakota. Decreases were recorded through Saskatchewan, in northern Manitoba, and in North Dakota. The increases exceeded the decreases to the extent that there was a small increase in the breeding population of ducks in the areas supplying the Flyway.

Beginning in 1956 a drying trend developed in the breeding range supplying most of the birds to the Mississippi Flyway. The drought continued and intensified during the summer of 1958, particularly in the important southern Saskatchewan breeding area. The number of water areas available to the birds was much below the average of the past few years throughout the southern portions of the Prairie Provinces and in the Dakotas. There was a lack of rainfall in northern breeding habitat also, but in the far north drought rarely affects the number of water areas and in many instances the conditions associated with lowered rainfall are favorable to waterfowl production. Fortunately, during June and July general rains occurred in southern Alberta and southern Manitoba sufficient to halt the drying trend and provide sufficient water in most localities to carry broods through to maturity. In southern Saskatchewan the first general rain occurred on July 12 and 13. Although water conditions were improved, the rain came too late to help the broods of some early nesters.

The July surveys revealed an increased production of broods in both southern Alberta and southern Manitoba. Production was good also in South Dakota. On the basis of a large increase in breeding population and favorable weather conditions in the Northwest Territories it is anticipated that production will increase in this important area as well. On the other hand, drought conditions were severe enough in southern Saskatchewan and North Dakota that there were marked reductions in brood production. Decreased production is expected also from Michigan and Missouri. Fall flight is expected to be about the same as last year from Minnesota.

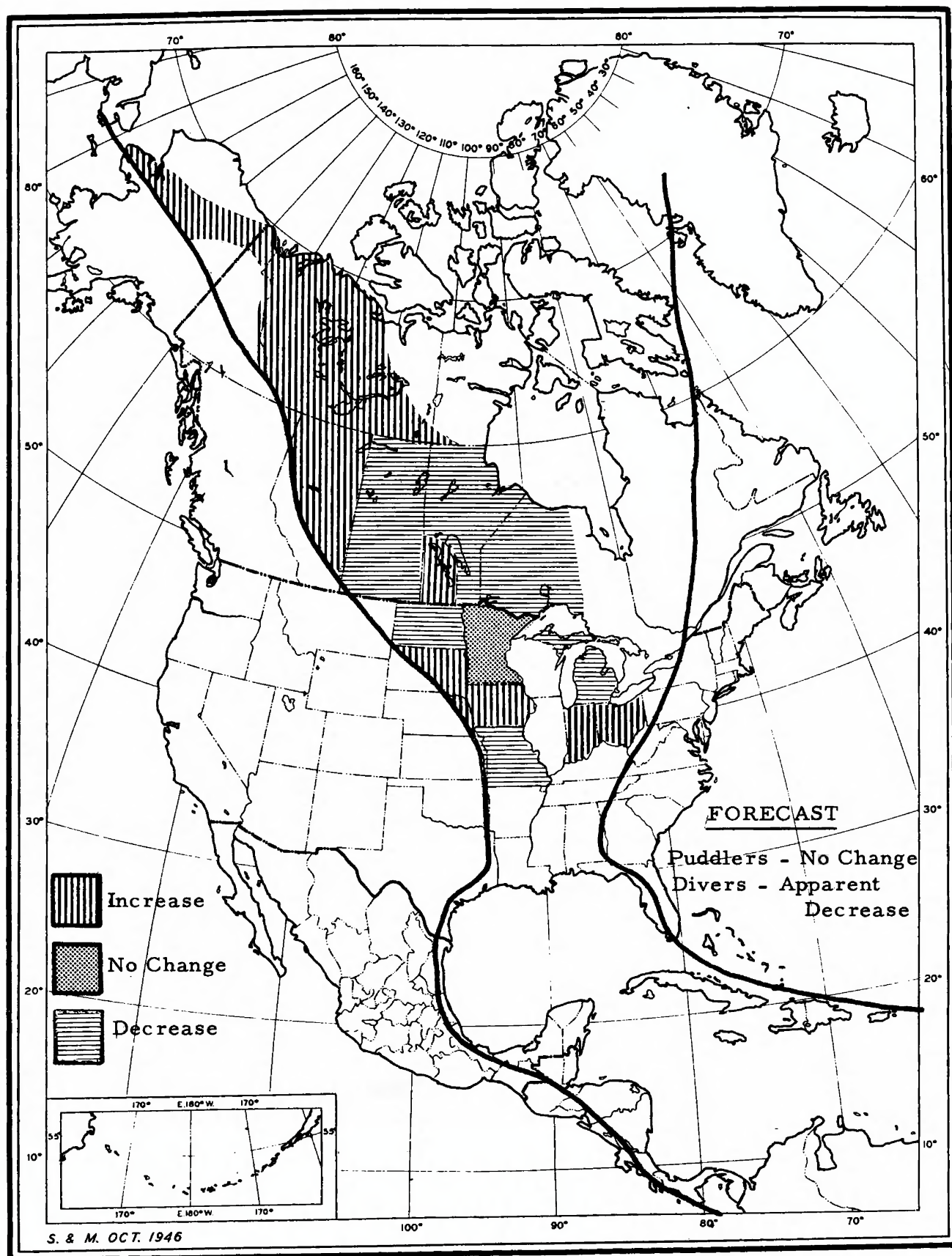
Overall, it is anticipated that the increases will balance the decreases and that the fall flight of puddle ducks in the Mississippi Flyway will remain about the same as in 1957.

Diving ducks appear to be less versatile in adapting themselves to adverse habitat conditions than puddlers and it is estimated that the drought conditions will result in a decrease in the fall flight of this group of species.

On the basis of no change in the wintering population of geese in the Flyway it is estimated that the fall flight of this group of species will remain about the same as last year.

Although the breeding population index for coot increased considerably in North Dakota and southern Manitoba, there was a marked decrease in southern Saskatchewan. In addition, the coot brood index decreased considerably in all breeding areas important to the Mississippi Flyway. Therefore, it is estimated that there will be a moderate decrease in the fall flight of this species.

1958 FALL FLIGHT FORECAST FOR DUCKS MISSISSIPPI FLYWAY



ATLANTIC FLYWAY

During the ten year period 1949 through 1958 the wintering population of ducks in the Atlantic Flyway gradually increased during the first four years and reached a peak in 1953. The population decreased in 1954, improved somewhat in 1955, and has been decreasing steadily each year since 1955. The 1958 population level is the lowest recorded in the ten year period.

The decrease has occurred in all of the important species. For example, the 1958 black duck index is 41 percent below 1957 and 55 percent below the peak reached in 1953; mallard decreased 54 percent from last year and is 56 percent below the peak; canvasback decreased 57 percent from last year and is 83 percent below the peak; ringneck decreased 28 percent from last year and is 76 percent below the peak; and scaup decreased 17 percent from 1957 and the index is 62 percent below the peak. It is of significance to note that this decrease has occurred at a time when the fall flights in other flyways have either been maintaining their status or increasing.

Unfortunately, the reasons for the population decreases in the Atlantic Flyway are obscure. Breeding population and production surveys have not reached the point where they were judged to be operationally feasible in the important Quebec-Labrador breeding area, and production survey techniques have not been developed for use in the northern portions of the Prairie Provinces or in the Northwest Territories, all of which are important contributors to the Atlantic Flyway population. It is not possible, therefore, to determine whether the decrease has been due to below average reproduction or to overharvest. Regardless, it is necessary to rely heavily on the results of the annual winter survey as a measure of population trend in the Flyway.

In the breeding areas supplying the Flyway where surveys were conducted there were increases in breeding population in Alaska, Northwest Territories, southern Manitoba, and Ontario. Decreases were recorded in Saskatchewan, northern Manitoba, and North Dakota.

Water conditions throughout the western portion of the breeding range supplying the Atlantic Flyway were characterized by drought. Although the drought was of sufficient intensity to decrease expected production from the important southern Saskatchewan area, increases are expected from southern Alberta, southern Manitoba, northern Alberta, and Northwest Territories, and from Alaska. Unfortunately, the bulk of these increases involve species which are not expected to migrate through the Atlantic Flyway.

It is expected, therefore, that there will be a further decrease in the 1958 flight of ducks in the Atlantic Flyway.

On the basis of a 14 percent decrease in the breeding population of Canada geese, as measured by the annual winter survey, it is expected that there will be a small decrease in the fall flight of this species.

On the basis of a decrease in the number of coot recorded during the January 1958 survey and the indications of below average coot production in the southern portions of Saskatchewan and Manitoba, it is estimated that there will be a considerable reduction in the fall flight of this species.

Brant present the only ray of sunshine in an otherwise gloomy outlook. The breeding population of this species as measured in January 1958 increased about 20 percent over 1957 and for the past 5 years has consistently been above the 10-year average. In view of the increase in breeding population it is estimated that there will be a corresponding increase in the 1958 fall flight.

1958 FALL FLIGHT FORECAST FOR DUCKS ATLANTIC FLYWAY

